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ORIGINAL COMMUNICATIONS.

THE STUDY OF ORTHOPEDIC SURGERY.[1]

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The word orthopedic is derived from two Greek words—*Orthos* (straight) and *Pais* (a child), not the Latin *Pes,* a foot. It is defined in dictionaries as relating to the prevention and cure of deformities in all parts of the body. Its limits, like those of other specialties, are not accurately defined, and vary from time to time as well as with the customs prevalent in different localities. While most of the patients are children, nevertheless adults are included. It also has not only to do with deformities, but with disabilities in which any deformity, if present, may be only an insignificant feature. Deformities and disabilities are closely related. Man has been so made that his shape is adapted to certain uses. If the shape is altered by a deformity it interferes with the function of the part; conversely, if the part is disabled then it tends to become deformed—usually both elements are present at the same time but in varying degree. Orthopedic surgery might be said to deal with such chronic local conditions as are characterized by deformity or disability of the part, requiring often long-continued treatment and necessitating the employment of apparatus and special mechanical appliances. It deals with cripples whether from accident or disease, congenital or acquired.

It is a branch and offshoot of general surgery, but is entirely different from it. Up until within a comparatively recent period it was taught and practiced by general surgeons, but at the present time it has progressed so far and its methods have changed so much, and departed so widely from our present-day surgery, that unless one is willing to study some orthopedic surgery he has no moral right to practice orthopedic surgery. It demands of those who practice it conservatism in the highest degree, infinite patience and perseverance, and a certain amount of ingenuity and mechanical skill. It deals with cripples, and to benefit them it is necessary, first, to avoid all destructive operative procedures, such as amputations, excisions, and the like, that increase the disability; and secondly, by medical, surgical, and mechanical means to cure their diseases and restore their disabled parts by lessening the deformity, transplanting, lengthening and shortening tendons, by educating defective parts and helping them by means of braces, splints, dressings, and all sorts of constructive and not destructive operations.

The first requisite in the practice of orthopedics is to cultivate an orthopedic mind. You must look at things from a different standpoint. Your first thought must be not how can I get rid of a part? but how can I better the part? Conservatism and addition are the watchwords of orthopedy. General surgery has advanced most on lines which are positive. Patients apply with offending organs whose usefulness has been practically destroyed and whose removal is demanded. Therefore we have the various operations of nephrectomy, cholecystectomy, myomectomy, hysterectomy, gas-

[1] An address delivered to the medical students of the University of Pennsylvania.

trectomy, appendectomy, and many other operations which are of a subtractive nature and do not add anything to the part. Understand, this is right when dealing with general surgical affections, but when a surgeon whose main work is on such lines encounters a case of tuberculous disease of the spine he cannot cut that out. When he comes to the same disease in the hip and knee he finds that early excisions have been tried, but that it was found that excisions of joints in the young produced such deplorable results that they were abandoned. In the same way club-feet were treated largely by cutting the tendons, but relapses were so frequent that other treatment was necessary. Hence it was that the surgeon found that if he was to treat orthopedic cases successfully he would have to learn a different kind of surgery, and that was conservative surgery. To do so was for most of them impossible. The field of general surgery itself had broadened so much that they had not the time, the patience, the inclination, nor equipment necessary, and hence they left orthopedic surgery to those who would especially devote themselves to it.

The moral of all this is that if you devote all your time to general surgery you should leave orthopedics alone, but if you wish to do some orthopedic surgery, then devote a certain amount of time and energy to mastering its principles and you will find that you will be well repaid. It is perfectly proper for any one, physician or surgeon, to treat such orthopedic cases as he may be familiar with. If you are interested in any special class of cases and study them up and educate yourself to take care of them, there is no good reason why you should not do so whether they are orthopedic or belong to any other special class. The orthopedist devised and gave to the profession the flat-foot plate, and now the bulk of painful feet are never seen by the orthopedic surgeon but are treated, and satisfactorily so, by general practitioners. This is as it should be, and every one has it within his capabilities to so specialize in individual lines, and as long as he is willing to go to the trouble to qualify himself, there is no reason why he should not do so. Most of our successful men have certain special side-lines in which they excel, and it is your duty to recognize those in which you possess ability and cultivate them, always remembering that if you undertake anything you should do it well. The groundwork of general knowledge which serves you in the other branches is also of service in this. A good knowledge of general medicine will enable you to recognize and treat the diseases which underlie many orthopedic troubles. A good surgical technique will enable you to carry out the many intricate operative procedures necessary in treating deformities.

A knowledge of hygiene and physical training is of the highest value. In the practice of this branch there is ample scope for your knowledge of medicine, for your general surgical and operative ability, to a greater extent perhaps than in any other field, for your skill as a hygienist in tuberculous and other cases; also for your abilities in physical education, training deficient muscles, etc.; and finally for all the mechanical and inventive skill that you can muster. A cripple will come to you for aid, and what you can do for him by any possible means, non-operative or operative, is only limited by the extent of your own knowledge and your inherent ability, skill, and ingenuity.

The operative part of orthopedic surgery resembles in some respects general surgery, but in others it is decidedly different. Orthopedic operations are usually only an incident in the course of the case, while in general surgery it is often the whole thing. In the former there is a general condition and accompanying disability that demand attention over a long period of time; this is particularly evident in all tuberculous diseases of the bones and joints. In ordinary congenital clubfoot the operative part may consist of division of tendons and wrenching the foot straight, but relapses will occur unless the foot is held in its corrected position until after one or more years the tendency to deformity has been conquered. A doctor has no moral right to simply operate on such a case and then turn it adrift. In general surgery an operation removes the

appendix and the patient is cured. If a nephrectomy is successful the patient is cured, and so it is with so many cases that the operator gets accustomed to dismissing them as soon as the operative outcome is settled. Of recent years the field of usefulness of operative surgery has so broadened that the demand for hospital treatment has far exceeded the available space. The consequence is that in order to accommodate as many patients as possible the time of stay in the hospital has of necessity been shortened. The number of patients treated is directly proportional to the rapidity of change. This is right in general surgical cases, but there are others. Where is the cripple to go who can only be restored to usefulness by treatment extending over long periods of time? His place is not amongst cases of general surgery. I have played both rôles. As a general surgeon I became impatient when an orthopedic case presented itself. I felt I had not the time to "fool" with it, I was keyed up to a different pitch; when, however, I restricted my work to orthopedics my attitude and feelings were different. Ordinary surgical cases then interfered with my orthopedic work. I had neither the time, the inclination, nor the equipment and surroundings necessary to deal with them, and it is with a feeling of relief that I can now refer them to my more militant friends, the general surgeons. So you see that each has his special field and neither has anything that the other desires. Operations in orthopedic surgery are frequent, but they are only one incident in a long course of treatment.

When, however, an orthopedic case presents for operation it demands not only that the operation shall be successfully done, but that a more or less lengthy period of subsequent treatment shall be given. It is this that some do not appreciate, and if you desire to do orthopedic work this is what you are to learn. You should be able first to diagnose your case and be able to correctly estimate its seriousness. Then if you decide to treat it you should know how much can be done for it by drugs, hygienic management, diet, operation, massage, physical exercise, training, apparatus, and even cultural and vocational training. When you undertake orthopedic cases, most of which occur in children, you thus see that you are not simply an operative surgeon but in addition must act as physician, parent, and guardian. The field is wide even though it be a specialty.

As students your time is limited, and the specialties to be considered are many. There is a tendency for the student to think that he has enough to do to learn general medicine and surgery and to ignore all the specialties that he possibly can. I myself at the outset deliberately ignored obstetrics and ophthalmology, but I afterwards reformed and attended a few confinements, prescribed correcting glasses, and did most of the ophthalmic operations from cataract down. If you ignore a specialty the chances are that you will be confronted with cases belonging to it as soon as you begin independent practice. It was so with me. My first work was as a ship surgeon, and I simply had to attend to a woman in labor.

When you practice medicine all classes of cases will apply to you. These affections which have been classed under the specialties are just as abundant now as they ever were, and the demands of modern times require more urgently than was the case years ago that they receive treatment; therefore it behooves you to be prepared. If you ignore them, what are you going to do when they present themselves for treatment? You will likely fail to recognize them, be unable to estimate their gravity, and will give advice which is practically worthless. A few such experiences would be enough to damn most any young practitioner in his community. I trust I have said enough not to discourage you, but to convince you that a certain knowledge of the specialties is not only desirable but absolutely necessary. Also that a study of general surgery alone does not qualify one to practice orthopedic surgery, but that you, before you leave your alma mater, will endeavor to gain some elementary knowledge of its foundation principles which will be of service to you no matter what work you follow afterwards, and will enable you to at least give proper advice even though you

may not desire to conduct the actual treatment of the case yourself.

It is not possible to advise you as to the length of time you should devote to orthopedic surgery. It will vary according to your industry and ability. You will notice I place industry first. You should put enough work on it to gain an insight into its principles. As to choosing it as an elective, it should be chosen at least by those of you who desire to practice surgery. The affections embraced under orthopedics will be continually intruding in a general surgical practice. You cannot avoid them, you cannot ignore them, and you cannot efficiently handle many of your general surgical cases unless you understand the orthopedic feature. It will admirably supplement your general course. You will find when you do private practice that you cannot dismiss your private cases when they are half-cured, as is so frequently of necessity done in hospital work. You must be able to restore your patient so that he is again ready to work. Orthopedic surgery is the ultimate repair shop where cripples resort to be restored to usefulness. These cases will apply to you for relief, so prepare for them. For those of you who do not wish specially to pursue the subject I would suggest that you obtain a standard work on orthopedic surgery and study it to what extent you can. Especially when any orthopedic case comes to your notice in your ward classes or hospital work, you should read up what you can about it.

Please do not make the mistake of thinking that even by so doing you will gain any proper knowledge of the subject. Don't be like the traveler who passes hurriedly through a foreign country and then returns home and criticizes its inhabitants and customs. To know a people you must live amongst them; to know orthopedics you must live and study in an orthopedic atmosphere. A better opportunity will be afforded those of you who desire to especially study this branch. Added to the usual operative and clinical work is another more systematic course with the added facilities of an active, well-equipped gymnasium, a flourishing dispensary, and a most instructive ward of thirty-five orthopedic beds. There is no lack of opportunity for those who desire it.

Let us now examine the subject more in detail. The field of orthopedic surgery is large, for it practically embraces the treatment of all cripples, whether born so or made so by accident or disease. The line of demarcation between it and general surgery is not well defined, so that not infrequently general surgeons have under their care cases usually regarded as orthopedic, but as a rule general surgical cases are rarely seen in an orthopedic ward. This is an instance of a rule that does not work both ways. Custom has something to do with the class of cases. In our hospital fractures are treated by the general surgeon, at least in their earlier stage, but in some other hospitals they are treated by the orthopedic surgeon. In some hospitals jealousy exists between the orthopedic and general staff on account of the border-line cases, but here the number of beds is so small and the amount of orthopedic and surgical material is so large that each has all the material he can find beds for and fills them as he desires.

It is impossible to detail all the cases which fall to the care of the orthopedist. As a rule they are chronic, but exceptions occur in the acute stages of tuberculous and infectious joint troubles and at intervals a case from other causes. Especially such cases are included which are liable to require more or less long-continued treatment by conservative measures, such as physical training, massage, manipulations of various sorts, the application of plaster of Paris and other dressings, and especially apparatus. Most joint and bone troubles are treated by the orthopedist, and this applies to those of infectious and metabolic origin as well as tuberculous; congenital deformities such as club-hand, club-foot, torticollis or wryneck, congenital luxations of the hip, and others; also certain paralyses, such as poliomyelitis or infantile paralysis, cerebral palsies or spastic paralysis, and also palsies resulting from disease and injury either of the spinal cord itself or of the peripheral nerves, especially of the hands and feet.

Also the many acquired deformities due to rickets and other diseases.

Also the many troubles due to static disturbance or an interference with the balance of a part. Under this head may be included the various weak and painful affections of the feet.

The abdominal ptoses and sacroiliac troubles.

Also scoliosis or lateral curvature of the spine.

In addition to these there is a large class of miscellaneous cases in which disability follows accidents such as malunion of fractures, of contractions disabling the extremities due to injuries, wounds, etc. Thus it is seen that the field is almost limitless; you can make it as large as you choose. The number of people in our community who are more or less crippled is simply appalling. No matter where you go there will be a bunch of cripples in your neighborhood which if you don't help never will be helped. The public conscience has quickened a little of recent years, and personal interest and even selfishness has become more acute. Efficiency is the watchword, and employers are not looking for cripples. If you allow a child to become a cripple, or if you fail to cure his crippled condition, it will be a handicap to him as he grows older; his earning capacity will be decreased, and he may become a beggar if he is lazy or a criminal if he is vicious. Let us take up and consider separately the various classes of cases. Suppose we start with the tuberculous.

TUBERCULOUS BONES AND JOINTS.

It is needless for me to comment on their frequency. They constitute a large part of orthopedic work. You will encounter them in your medical and general surgical work, and it is your duty to recognize them so as to appreciate their true gravity and be qualified to give proper advice. Bone and joint tuberculosis is as a rule insidious and often exceedingly difficult of recognition. Treated early in its course it responds readily, but when fully developed it is both destructive and persistent.

A fact that I would like to impress on your mind is the seriousness of the affection. It is not an affection to be trifled with, and if you undertake the treatment of a case your responsibilities are great. It is difficult to say when a case is cured, and it is impossible to tell when a new outburst will occur. Cases which have been quiescent and apparently cured for years frequently start up again, and perhaps by a tuberculous meningitis, cause death. Its resistance at times to treatment is so great and a tendency of a renewal in activity so persistent that it almost rises to the dignity of being classed with the malignant diseases which it so much resembles. It not only kills a considerable number, but it leaves those who have been its subjects usually more or less maimed and disabled, handicapped for life, with the ever-present liability of a subsequent recurrence.

Surely when considering a disease so common and serious as this, that is bound to intrude itself in your practice, it is but just that you should devote a certain amount of time to its consideration.

Tuberculosis is not a congenital but an acquired affection. It is caused by the tubercle bacillus, which, after introduction into a susceptible individual, has provided for its growth and development some spot in the cancellous bone or in the synovial fringes of the joints which serves as a nidus or nest in which it makes its home. This nidus is probably produced as the result of a trauma too slight to be in itself serious, but sufficient to cause a small effusion of blood or serum and a weakening of the normal resistance of the part.

The tuberculous process in itself is a painless one, and it is only when it is extensive and involves surrounding parts that it is accompanied by pain. This element of painlessness is evidently most often present in those cases that are in the early stage before tissue destruction has become advanced. For this reason the recognition of the disease early is rendered all the more difficult and apt to be overlooked. It is frequently overlooked, and the presence of such a large number of bad tuberculous bone and joint cases in our midst is speaking evidence of some one's incompetence. Modern medicine is not curative medicine;

it is preventive medicine. You will recall that in the definition of the word orthopedics it was said to be the prevention and cure of deformities; prevention is first and is better than cure. If these bad cases had been recognized early and treated properly most of them would have been suppressed in their infancy. It suggests the thought as to what is going to be the condition of your bailiwick. Are you going to have a lot of tuberculous cripples around you, or are you going to recognize them early and cure them? You cannot dodge your responsibilities; you are to a considerable extent the guardian of the children of your community, so qualify yourself for the task.

In questions of diagnosis when mistakes are made it is often not due to an inability of the physician to judge correctly, but rather to his neglect to take the proper course to ascertain the truth. He fails to make the necessary examinations. This is particularly liable to be so in the class of cases we are now considering. It is a common event for children to receive small injuries which never amount to anything serious. When, however, a child is brought to you for some slight joint injury, be slow about declaring it to be of little account. It may be the first signs of a commencing tuberculous disease. The mother may notice that the child tires easily and often sits down to rest itself, and resents being roughly handled. She suspects that something is wrong, but cannot tell what it is. The child may perhaps have only a slight indisposition due to intestinal or other derangement which may only be temporary, but your duty in such a case is clear. First obtain as accurate and full a history of the complaint as possible; then carefully watch the movements of the child; and finally strip it and make a most careful examination. Direct your attention particularly to the spine. Examine the backs of children whenever an opportunity presents so that you will become familiar with the normal appearance. Note the spinous processes; see whether they are in line as they should be, note whether one is more prominent than the others. As you know, the seventh cervical spine is called the vertebra prominens on account of its normally projecting farther out than the others. If then you find another spine as prominent as the seventh cervical you may be sure that it is pathological, and is probably the kyphosis of a Pott's disease or vertebral tuberculosis. Note whether the spinal column is as flexible as it should be; get the child to bend over, and note how it picks things up from the floor—whether in so doing it supports its trunk by putting its hands on the thighs. Also have the child lie flat with its face down; then lift the legs up until the back bends, and note if it bends evenly. If disease is present there may be a section of the spine that is stiff. Turn the child over and palpate the inguinal regions and abdomen on each side. Not infrequently a psoas abscess can be felt long before a kyphosis shows itself on the back. While you are doing this you will look for any evidences of rickets or other disease. If after a careful examination and search you are unable to definitely locate any trouble, you are not to dismiss the case as unimportant. You can prescribe a laxative and instruct the parents as regards the diet, and request them to carefully watch the child and bring it again to you for another examination. It is not an infrequent occurrence for these obscure cases to reveal their true character at a subsequent visit. If the signs point to a definite locality, such as the spine or hip or knee, have a Roentgenogram made and carefully examined. Try a tuberculin test by the Von Pirquet or other method, although the results should not be accepted as conclusive, but rather as confirmative. Sometimes the question of diagnosis as to the presence of Pott's disease is practically impossible, yet its solution is in the highest degree essential. The question as to whether it is a case of lateral curvature must be settled. If it is a case of Pott's disease it must be treated by mild, gentle, protective, and restful means; if it is a case of lateral curvature, exactly the opposite course is to be taken, and exercise, training, gymnastics, and an active outdoor life are to be advised. You will thus observe that if you make a faulty diagnosis

you will not only fail to advise what is best for the patient, but you will be advising to follow the very course that is most harmful. This is practically the case with tuberculosis of other joints. I recall a case of a small child brought to me with coxalgia or hip disease, in an advanced stage. On inquiry the mother stated that she had had the child under the care of an irregular practitioner for a year. Of course the constant manipulation and movement of the joint for that length of time produced the disorganization of the joint that was to be expected. Children with hip or knee tuberculosis may run around and play and escape notice until the disease is well established and the swelling or limp quite marked. Some parents are very careless and non-observant, and some diseases are particularly deceptive, and this is one of them. Study these patients carefully, watch them sharply and examine them frequently, and you will be rewarded by detecting and recognizing the disease early and curing it satisfactorily.

Suppose now that you have decided after thorough and repeated examinations that you have a case of tuberculous bone or joint disease to deal with, what are the lines on which the treatment is to be conducted?

Treatment of Tuberculous Cases.—There are few, if any, diseases on which so much work has been done as tuberculosis. This is true not only of its pulmonary form but also of the joint lesions. Notwithstanding this I speak but the truth when I say that perhaps the bulk of these latter are not properly treated. I judge that but a comparatively small proportion of them come under the care of the orthopedic surgeon unless the case is already well advanced. Tuberculosis, like all other complaints, is a queer disease. If a person affected with it is to recover he must be treated in a very definite and peculiar manner.

I have already pointed out to you that Pott's disease will not respond favorably if subjected to the treatment suitable for a case of lateral curvature. One would think that tuberculous bones and joints were so frequent and well known that every doctor would be capable of carrying out a proper line of treatment. This, however, is not the case. The numerous cases of cripples from hip, knee, and other tuberculous joints seen in the community is abundant evidence of either neglect or failure on the part of those into whose hands they fall.

The reason the doctor does not treat these cases efficiently is because he never was taught how to do so in college and did not learn afterward. The proper teaching in our medical institutions of this, amongst other things, would take up so much time as to seriously encroach on other subjects. It has been placed amongst the specialties, and as such is apt to be regarded as being beyond the pale of student endeavor. If a thing is worth the doing it is worth doing well. In this class of cases, if you do not do your work well you had better not attempt it at all. If you really propose to treat these cases is it too much to ask that you take the time and effort to qualify yourself for the task? Consider what it means and what is at stake. Suppose you have only one or two cases of tuberculous joints a year to treat. Suppose you fail to give efficient treatment; what is the result? The result will be that you will be turning loose on the community one or two needlessly crippled children every year, children who are handicapped in their efforts to become self-supporting and who are unable to assume their proper part of the communal burden, and who sink into the deplorable class of the idle and dependent. They are likely to live for quite a while and parade their crippled limbs before the eyes of yourself and the people generally. Your good cases being cured will quickly flee out of sight, but your failures will remain to torment you. You may think that if you read up these cases in your general surgical works you will be equipped for their care. Such reading can do you no harm, but it is not enough; you must do more; you must put some special work on the subject if you are to get the special knowledge which is required, and this you can do if you wish to.

There are two lines in which the treatment of tuberculous joints should be carried: one is directed toward the local and

the other to the general condition. It is only within a comparatively few years that we have appreciated the value in curing a local affection of improving the constitutional conditons. Prevention is better than cure, and we try to prevent deformity by stopping the disease process before destruction of the affected part is accomplished.

We do this not only by our local treatment, but by treating the case generally as one would if the lungs, instead of the bones and joints, were involved. The meaning of this is that if a case of incipient hip disease presents itself for treatment, you are not to put a brace on it and send it home, to be again seen some time in the distant future. You must appreciate two things: first, the gravity of the case, and secondly your individual responsibility. They both demand that you give the very best care and attention to the patient that you possibly can, and that over a long period of time. It is no six-weeks-broken-bones job. Keep that child under your most watchful eye for a year at least. Your first duty is to see that the affected part is properly protected. We continually hear about rest being advised for tuberculous joints. What is the good, however, of saying keep the joint at rest when one does not know what rest is? If you do not know when a joint is properly at rest and do not know how to put it properly at rest, then your efforts are useless. As a matter of fact very few except those who have studied rest from an orthopedic standpoint know what it is or how to enforce it. To appreciate it you should see the cases treated, and after a while you will begin to recognize it when you see it and ascertain how to overcome the difficulties encountered in obtaining it. How are you going to keep a wiggling, restless, spoiled child still? Yet if you do not do so the child may lose the joint. There are many ways employed—confining the child to bed, adhesive plaster and weight extension, splints, braces, plaster-of-Paris dressings, and the like. Sometimes one of these is necessary, sometimes another. Each individual case has its individual requirements. You ought to know how to employ each of them effectively. The average practitioner is practically unable in most cases to apply any one of these local measures efficiently. He cannot keep a child in bed. If he puts on extension the toes will probably be pointing toward the wall instead of toward the ceiling; if he puts on a splint it will be sliding all around the limb; if a brace is used the straps will be so loose that it is utterly inefficient; and as for plaster of Paris, those that come to our notice can be considered nothing less than a joke. These means and appliances are used with a very definite and precise object, and it is your duty to learn to apply them so that they accomplish their object. Don't touch orthopedic cases unless you are willing to go to some trouble. It is not good surgery to order a brace, which some one else can make, for a case which requires a plaster-of-Paris dressing which you yourself should apply. One of the reasons why orthopedics is a specialty is that the orthopedic surgeon is willing himself to put on a nasty, messy, plaster dressing when it is indicated and the rest of the world for various reasons is not.

General Treatment of Tuberculous Cases.—Underlying the commencement and course of tuberculous and joint troubles is an abnormal and more or less disturbed constitutional condition. Careful people do not have lice in the hair, because if any should be deposited they would find the surroundings uncongenial and betake themselves elsewhere. So it is with the tubercle bacillus. If it finds a congenial soil it stays and flourishes; if it is uncongenial the bacillus is encapsulated or killed. Tuberculosis as we see it is an acquired affection. This being so we can influence its course by altering its environment. We hardly know what condition of the human system is present which predisposes to or favors the outbreak of tuberculosis. We do know, however, that as the general health improves the tuberculous process can be overcome.

Tuberculosis is kept alive by the constant irritation of movements of the affected part. To secure quiet we frequently confine these patients to bed. The question is often asked whether the confinement to bed is not bad for the general health. To this it can be said positively that in this class of cases it is

not. If a tuberculous child is kept abed, well fed and attended, and placed as much as possible in the open air, it almost certainly improves. This improvement is usually prompt, and is perfectly evident to the parents as well as the doctor. It is the most important means of securing the subsidence of active symptoms and the cure of the disease.

The treatment suitable for lung cases produces the same good results when carried out in patients affected with bone and joint lesions. There may be some difference of opinion as to whether sunlight is of great value in lung tuberculosis, but in affections of the bones and joints it is regarded as being of the greatest value. Therefore in undertaking the treatment of a case the first problem for you to solve is how to keep the child in the open air and sunlight as much as possible.

In our cases we put them out on the porch instead of keping them in the wards, and protect them from the cold by warm clothing, blankets, etc. We also expose the lesion as much as we can to the direct rays of the sun. This open-air and sunlight treatment has been carried out most efficiently by Rollier of Leycin, Switzerland. He has published some illustrations showing children with only a breech-clout and slippers on playing in the snow. We do not go so far here, but the principle of the treatment is correct and you must carry it out as thoroughly as you can. These children should be carefully and regularly fed, but drugs are only to be used as occasional aids. Perhaps a few remedies, such as cod-liver oil, syrup of the iodide of iron, compound syrup of the hypophosphites, and a laxative now and then, will be all that will be required. The hygienic management is the essential part of treatment, and according to your success in accomplishing it will be the progress that your case makes. The disease is a subtle, persistent, deceptive one, and after apparent cure tends to recur. To conquer it requires infinite patience and watchfulness. It must be handled with the greatest gentleness and treatment persisted in for a long time after active symptoms have vanished. As our Italian friends say, "Chi va piano va sano e lontano" ("Who goes softly goes safely and goes far"). Never be impatient and never give up.

PARALYTIC CASES.

Another large class of orthopedic cases are those caused by paralysis. Of this class there are two main types, the cerebral and the spinal. There are others, but these are the most common.

The disease known as anterior poliomyelitis or, as it used to be called, infantile paralysis, is probably the one best known to you as it is the one most frequently seen. A few years ago the cases were not so abundant and were recognized almost solely in young children, hence it was called infantile paralysis; but in recent years cases seem to have increased in number and attacked people of all ages. It also manifests itself differently. In its typical form a young child is seized with often a slight attack of indisposition, with perhaps a little fever and possibly some digestive disturbance. This may occur in a single night or may extend over a few days, but as it subsides the parent notices that the child does not use an arm or leg, or it may be paralyzed in both legs or down one side. This paralysis gradually tends to disappear, and continues lessening for six months to a year; it then apparently almost or quite ceases, and the child is a typical paralytic.

A very few of these cases recover completely, but nearly all have a greater or less amount of paralysis which generally proves to be permanent.

I cannot now go into the details of this affection, but as in other troubles it is necessary to correctly diagnose and treat it.

As a rule the diagnosis is not difficult. In the initial attack pain is occasionally a marked symptom. When this is the case care should be taken to differentiate the disease from rheumatic affections, conditions which also occur in childhood. A careful study of the history of the case with the presence of paralysis will usually decide the character of the case. Later on it may be confounded with the hereditary ataxia of Friedreich, or with pseudomuscular hypertrophy. Correct diagnoses are to be made

by a careful study of all the available data of history, signs, and symptoms.

Treatment.—This disease furnishes a large number of the permanent cripples floating around in the community. Many of them have had little or nothing done for them because they are regarded as hopeless cases. In nearly every case a great deal can be done to better its condition and make it a more efficient member of society. It is your duty to the patient and community to see that it receives proper treatment. Of course they are a nuisance—slow, long drawn out, needing careful attention for many years; but what are we here for if not to help the crippled and aid the helpless? The handling of these cases requires skill and knowledge.

As I have already remarked, prevention is a larger element in orthopedic treatment. When a child is attacked by this paralysis it is a healthy child with normal limbs. The deformities start sometimes as soon as the acute symptoms subside; in other cases the deformities may not be evident until years after the initial attack. Therefore if you are called to an acute or recent case you should not cease your attendance when the acute attack has passed, but you should keep the case under observation to see to what extent recovery ensues and whether or not any part is left crippled. The extent of the paralysis varies greatly. Of recent years the character of the affection seems to have changed for the worse. Instead of confining itself to lesions of the spinal cord it sometimes attacks the brain and cranial nerves also. The facial nerve is one of those most frequently affected. In some instances almost the whole body seems to be paralyzed. Of course when essential parts of the brain are involved, or when the muscles of respiration are paralyzed, death ensues. I have now under my care a boy very extensively paralyzed whose brother, stricken at the same time, died. When the muscles of respiration are only partially affected the child can breathe and talk, but not strongly. This adds much to the gravity of the case, because if the patient catches cold, with its attendant coughing and sputum, expectoration may be difficult or impossible and death may ensue. It is for this reason that the patients so affected should be most carefully guarded against draughts, changes of temperature, etc.

The muscles are not all paralyzed to an equal degree. A paralysis which is almost total at first may within a few weeks largely disappear. A certain amount, however, is almost certain to remain, and often a very large amount. Any member may be paralyzed, and often a leg and arm of the same side, or both legs alone, or one or other of the arms, or even both arms and both legs, but not completely. It is rare that the paralysis of a limb is total. Almost certainly some of the muscles escape and retain their function. The individual muscles also vary in the degree of their disability; some are totally paralyzed, others but slightly. A characteristic of this paralysis is the rapidity of the loss of the reflexes and the occurrence of atrophy. Atrophy occurs from both the poison of the disease, which may be termed trophic, and from the subsequent lack of use of the muscles.

The muscles of the body normally are arranged in pairs or in such a manner as to maintain a balance of power in the [illegible]. For every flexor there is an extensor, every abductor there is an adductor, every internal rotator or inverter there is an external rotator or everter. When, as occurs in this disease, the muscles are paralyzed unevenly, then the balance of the part is disturbed. The healthy muscles being stronger than the partially or wholly paralyzed ones, overcome them and stretch them unduly. This overstretching still further injures the affected muscles, and the power being now applied unevenly tends to displace and distort the part, eventually causing both deformity and increased disability. These changes are usually slow and gradual and are unaccompanied by pain. On this account they do not present the alarming feature of acute ailments, and the parents may defer indefinitely having them attended to. This partly accounts for the number of cripples going around who have not received treatment. As the results of the paralyses are continually manifesting themselves for years following the onset of the

disease, it is evident that treatment has to be changed from time to time and necessitates the surgeon looking after them for many years. We will recur again to this later.

The point which you should appreciate is that you cannot treat this disease as you treat others. When you see a case of measles you treat it for a certain period of time and the child recovers or dies, and you dismiss it from your mind. That ends that case—it is finished. With infantile paralysis or poliomyelitis, on the contrary, after your successful handling of the patient in its acute attack the main troubles often are yet to come.

Statics has to do with bodies at rest, dynamics with bodies in motion. I have already spoken to you of the disabling and deforming action of the muscles which have escaped paralysis. The troubles which they give rise to may be called dynamic troubles and are most evident when the use of the affected part is attempted. There is another set, however, which are called static troubles, and they are largely concerned with the weight-bearing functions of the body. [illegible] are most in evidence when the muscles [illegible]ne trunk and lower extremities are involved. Man progresses normally in an upright attitude. To maintain this attitude and locomote or move around properly it is essential that the center of gravity be over the supporting base. In other words, the body is sustained erect by being balanced on the feet. If, by the paralysis, this balance is disturbed the center of gravity is displaced to one side and instability results. To restore the equilibrium the parts are bent in a compensatory manner, and the center of gravity again is brought over the base and stability is once more gained. This stability is only gained, however, at the expense of considerable deformity. Instead of the patient being straight he is twisted and contorted into all sorts of positions. In many cases unless the patient assumes these positions he can neither stand nor walk. When the balance is disturbed, instead of the body weight being supported by a practically straight line of support beneath it, it is supported by a varying number of curves and angles. The weight then tends to fix and increase these curves and angles and to rapidly aggravate the deformities. These deformities being caused by dead weight or gravity are frequently called static deformities. When the paralysis is of such a slight degree as to constitute a mild paresis it may take a long time, perhaps years, before the effect of a lack of balance begins to manifest itself, and from that time on the static deformities begin to become more evident and increase.

It is impossible at this time to go into all details of this curious disease, but we may still allude to a couple of other things. The pain which is now so frequently seen used to be unknown. This pain in the early stage may be so marked that the child cries if it is touched or moved, and if you are not careful you may think the child has acute rheumatism, rickets, scurvy, or some other painful affection. This pain may not be present at any stage, or it may last, as I have seen it, for months. It used to be thought that the disease was confined to the anterior horns of the spinal medulla, but these pains are evidence that the meninges are also involved.

I would also like to allude to the subject of contractions. It is obvious that when one group of muscles are paralyzed the muscles of the opposite corresponding group will contract. As the paralysis is of a long enduring or even permanent character the persistent and continuous contraction of the normal muscles eventually causes them to shorten; the contraction or retraction is then permanent, and before the part can be brought again to a normal position this must be overcome. There is another kind of contraction, however, in which it is the affected muscles and not the healthy ones that shorten. When this occurs the disease has been of a meningitic type, and the contraction is of a spastic nature and analogous to the contractions which occur in the meningitis accompanying the spinal paralysis of Pott's disease. This contraction tends to show itself much sooner than the other, and the attending physician should be on the watch for it and guard against it. In these cases supports of some kind are needed,

sometimes a comparatively short time after the subsidence of the acute attack or even before it has fully passed. The persistence of spasticity in some cases of poliomyelitis may cause them to be mistaken for the spasticity which is of cerebral origin.

Then comes the question as to what is to be done for these cases. The treatment of the acute stage does not differ materially from that of other infectious fevers. Soon, however, the accompanying disability and developing deformities demand attention.

It is not common for a case to remain as badly paralyzed as when it was first attacked. It is the rule for the paralysis to begin to disappear almost as soon as the acute symptoms pass off. This disappearance may be rapid for a few weeks; then it becomes less and finally appears to stop.

There is a great difference of opinion as to how long a paralyzed limb may continue to improve, and it is a vital point. If you ask a neurologist he will probably say that if a paralyzed muscle does not show signs of recovery of function in a year it is practically a dead muscle. Some orthopedic surgeons, notably Vulpius of Heidelberg, take the same view. Occasionally there is one who will extend the period of possible improvement to one and a half or even two years, but they deem themselves generous in extending the time so far.

The importance of the question is evident when we remember that if a muscle is dead after one year further treatment to revive it is useless. It means that efforts to restore these limbs will be abandoned after one or two years' trial. I feel quite strongly on this question.

I believe when a thing is once dead it stays dead, and nothing can revive it. There is a decidedly practical side to the question, and you are interested in it. It is not always easy or even possible to say whether a muscle is dead or not. There can be no doubt but that, possibly in the center of the lesion, some motor nerves are actually killed and destroyed. These may never regenerate, but around the fatal spot the severity of the lesion gradually decreases until finally healthy tissue is reached, and we have in the same limb muscles which are apparently totally paralyzed, others that are partially paralyzed, and others that are perfectly healthy, and it will be impossible to draw a sharp line of demarcation. A patient may be unable to move a muscle. Is it dead? Put the electric current on it and it may respond. A limb may appear paralyzed and fail absolutely to respond to either the faradic or galvanic curernt. Is *it* dead? Not necessarily, for I have seen patients voluntarily move muscles from which expert electricians were unable to get any response by the electric current. If therefore there are some living muscles that fail to respond to electrical stimuli, and other living muscles that fail to respond to an effort of the will, is it not reasonable to suppose that there are some muscles which although they still retain a living spark nevertheless refuse to respond to either stimuli? I believe there are such muscles, and if there are is any physician justified in saying to the parents of the paralyzed child that nothing can be done for it? Yet such is too often done. It is my firm belief that improvement in most cases will go on as long as intelligent and persistent efforts are kept up. It may not be so rapid as one might wish, but it varies much in different cases. It is my experience that improvement occurs and a disabled limb continues to become more useful, not only for one year after the acute attack, but for two, three, and many more. In this question do not be pessimistic; be optimistic. Work hard yourself and encourage the patient and parents. It is infinite cruelty, because unjustified, to rob a distressed mother of the hope that her child may in the future be considerably improved. Don't attempt to play the part of a prophet with lugubrious predictions; tell the truth and encourage the parents to use their best efforts, and assure them that their work and care will be rewarded.

It is a more or less academic question as to how the improvement which occurs in these cases is produced. It does occur, and whether it is due to a regeneration of the originally affected nerves, or whether it is due to a partial taking up of the lost functions by the surrounding uninjured parts, is immaterial.

The principles of treatment vary with the stage of the disease. In the acute attack the limbs should be kept at absolute rest, and sometimes even protected from the weight of the bedclothes. Even light supporting splints may be of service. As to the methods of handling the resulting paralysis there are sometimes marked differences of opinion. It is generally agreed that during the stage when more or less tendency to spontaneous improvement is present, say for the first year, massage and electricity are to be given a faithful trial. The greatest good, however, is to be expected from persistent attempts to use the affected limb. This may either be done voluntarily by the child in playing or moving around, or the parents may work with the child, inducing it to go through all sorts of motions and exercises calculated to bring the muscles into play. To be successful in this requires considerable ingenuity and infinite patience. The doctor can suggest, but the carrying out devolves on the parents. Lucky it is that many of these children have parents who are simply devoted to them and labor with them unceasingly, observing each new effort or action which the child acquires as time progresses.

At this stage the question of apparatus will come up and must be decided.

I suspect that neurologists are more disinclined to order apparatus than is the orthopedist, and perhaps they are correct. Some hold that the effort of a paralyzed limb necessary for it to exert to carry around the apparatus or brace, which is more or less heavy, is too much for the strength of the weakened child, and that it is better to let it crawl or drag itself along as best it can without it.

To decide this question requires the exercise of judgment and common sense and should not be decided offhand by one's prejudices. Apparatus has been brought into discredit because it is too frequently ordered by those who do not know how it should be employed. Please don't think that no recent case requires a brace nor that every old case does need one. Never order a brace until you have a very distinct idea as to what you expect it to accomplish. Always have a definite plan as to what you wish to accomplish and order the apparatus accordingly. Braces are prescribed for two main objects: one is to prevent deformity and the other is to support the affected part. If either or both of these objects can be achieved, then a brace is worth while. Suppose a child has a paralyzed foot. As it goes around the toes drop and the foot may turn out or in. If the child persists in walking on it a deformity will occur. Here a brace to hold the foot in proper position will afford support and prevent deformity, and notwithstanding its weight is well worth using. Many cases are so paralyzed that without the support of apparatus the patient will not be able to walk at all. In such cases as these braces are a necessity, and each brace should be carefully designed so as to suit and meet the indications of the particular case which is to use it.

The ideal time for the use of braces extends from the time the paralysis is fully developed until the period of active improvement has passed and the progress appears to have stopped. Ordinarily I hesitate to operate before from two to five years after the occurrence of the paralysis. Most often I wait the latter time, and very rarely will do anything radical as early as the former.

The apparatus is used to aid the patient and bridge over the time during which improvement is occurring. When, however, there seems to be but little likelihood of further spontaneous improvement, then we cast about for some means by which the patient can be supported and protected without the use of artificial appliances. Orthopedic surgeons have sometimes been regarded as merchants with an undue fondness for mechanical appliances with which they are supposed to load their patients at every available opportunity. I am not willing, however, to admit that the orthopedic surgeon is possessed of any worse morals than his colleagues in other branches of medicine. If he was a seller of instruments whose object was to dispose of them, then there might be some grounds for suspicion, but he is a practitioner of medicine and derives no more benefit from the braces

which he orders than the physician does from the medicine which he prescribes. Both do the best they can for the good of their patients, and the best orthopedic practice now demands that all braces are to be eschewed when the same objects can be obtained by better means. The desire of the surgeon to dispense with braces has led to a new era in orthopedic surgery. It has been found that by operative means the impaired balance and weakened support can to a large degree be restored to a paralyzed limb. By transplanting tendons from one side to another the muscular power may be given a better balance. Sometimes a tendon is lengthened, more rarely shortened. Flail-like joints are given stability by the formation of an artificial ankylosis called arthrodesis, and finally operations of various kinds are done with the view of fixing a weakened limb in a certain definite position most favorable for use by the patient. By these means they are frequently enabled to walk without apparatus and are forever freed from its annoyance and trouble and expense. In a certain proportion of very bad cases, however, the paralysis is so extensive that as yet we have been unable to dispense with apparatus. In some we are fortunate if we are able to have them move around even with both apparatus and crutches. As has already been stated, however, radical operations are only done when improvement is apparently at a standstill years after the onset of the paralysis, and when it is desired to free the patient from the use of apparatus. Time will not permit me to go into details of treatment, but some idea of the physical education of these crippled children can be obtained by you if you care to pay a visit to our gymnasium during working hours. Be assured that all this work would not be put on these patients did we not feel that our efforts are being repaid.

Terrible as are the ravages of poliomyelitis, they sink almost into insignificance before the dreadful affliction cerebrospastic paralysis or, as it is sometimes termed, Little's disease.

This paralysis is, unlike the spinal type, congenital in origin. Its probable cause is some traumatism to the brain, whether induced by accident or disease. Certain it is that in many cases a history of difficult parturition, injury, or delay in the birth of the child is obtained. Occasionally you will be called upon to pass judgment on them—you cannot escape.

Usually the infant is strong and well nourished and for a long time nothing unusual may be noticed. New-born infants at best are rather insignificant specimens of humanity and but little is expected of them. What little is expected of them, however, is usually supplied by the vivid imagination of the fond parents. They are not expected to walk, or talk, nor to see right, nor hear right, nor to act in any intelligent or rational manner. They are however expected to feed, and as long as they do this everything is satisfactory. When, however, the novelty of the infant's advent has worn off and it grows larger its parents become more critical. They begin to compare their baby with other babies. In this they have the assistance of all females who are within range of the infantile sphere. The result is that when it gets a few months old, if there is something evidently wrong it will be recognized and you will be asked to pass judgment thereon. They may ask why the child continually rolls its eyes, or twists its head back. Why don't it sit up? Why don't it try to creep? Why does it hold its legs so stiff, or clench its fists? Finally, when the time comes for it to walk and talk, say between the ages of one and two years, it will do neither. Then they become alarmed and clamor for aid. What are you going to tell them? Prepare for the ordeal by studying up and informing yourself about the cerebrospastic paralysis of children. This disease is totally unlike other paralyses. The lesion in poliomyelitis is a medullary or nuclear lesion which involves the centers below the surface. Hence we have produced the typical flaccid paralysis of that disease. In this affection, however, the lesion, a blood-clot oftentimes, is a superficial cerebral one and as such its main characteristic is its contractive nature, often spasmodic. In the eyes it may produce a continuous rolling in an aimless fashion not exactly like the incessant vibrations of the

nystagmus cases which you will see in your opthalmological clinics. If the neck is affected the head may roll helplessly from side to side or it may be drawn sharply backward. The face may be quite distorted. In the limbs, however, its evidences are most frequently seen. The cases might be said to increase in gravity from the feet upward. If the affection is very slight it may only show itself when the child runs or walks, when it will tend to raise the heels by contraction of the tendo Achillis. A more severe case will have contractions of the hamstring muscles; still graver cases show contractions of the upper extremities as well as of the trunk; even the mentality may be almost lacking, and a greater or less degree of idiocy is a common condition.

The task is not a pleasant one to have to inform a mother that the reason her child does not talk is because it is an idiot. The picture is a bad one, but it will rest with you to tell the parents what can be done for the afflicted child. By the time you see it the traumatism has done its worst and you have only to deal with its results. Considerable can be done for some of these children, but in others we are helpless. Let me ask you, however, not to rashly accept the responsibility of deciding the fate of these children. Give a very guarded opinion, and if you do not feel justified in deciding yourself, then transfer the burden to some one more experienced in this class of cases. Many of these children though they have distorted bodies have bright minds. By means of various operations directed especially toward lessening the excitability of the nervous centers, in many cases much improvement can be wrought. In others, apparatus, massage, and training are of service. The problems are amongst the most difficult we have to deal with, and before you condemn a case as hopeless ask the advice of all your friends.

Another interesting group of orthopedic cases are called static, because the passive pressure of gravity enters into their pathology.

STATIC TROUBLES.

The various uses of the body are so numerous that disturbances of function are not often especially designated as dynamic because they are nearly all dynamic. When, however, we look for static troubles we find that practically considered they are all due to one power or force which is virtually not moving but at rest; that power is the force of gravity. This power of gravity acts persistently, effectively, but without violence. It is extremely insidious and usually unsuspected until it has accomplished a resulting deformity. This deformity in its earlier stages is merely a displacement of the parts due to a relaxation of the ligaments, but in its later stages there is an alteration in the shape of the bones and a contracture of the ligaments, tendons, etc., on the side of the concavity of the flexed part. As the superimposed weight decreases from the feet upward it is evident that static troubles are more frequent in the feet than in the other parts above. Suppose a foot that was built to support the weight of the body for five hours per day was compelled to support it for ten hours. It is evident that something would give way; what would it be? Would it be the muscles? No, because the muscles are concerned in movements, and their troubles are dynamic ones, and we are discussing static affections. On what tissues is the weight of the body borne when at rest? On the ligaments and bones. Of these two the ligaments are the first to give way, and either the arch of the foot descends or the foot pronates or rolls outward. In either case the ankle moves more to the median line and the center of gravity is disturbed. It creates pains due to stretching of the tissues on the inner side of the foot, and pains due to compression of tissues on the outer side. The foot rotates outward, and this makes a lateral pressure on the big toe and a condition of hallux valgus or bunion develops. The foot going out throws the knee in, and knock-knee may begin to show itself; even the hips are held stiff and an awkward gait becomes evident. This in turn influences the posture and round back is not uncommon.

These static or weight-bearing troubles manifest themselves whenever unusual strain occurs. Many of the cases of sacro-iliac distress and pains in the back are trace-

able to the same cause. If through bad posture or other causes the balance of the internal viscera is disturbed we see developed ptosis of the stomach, intestines, etc. If the spine is involved we see scoliosis or lateral curvature arise. This will be sufficient, I trust, to give you some idea of the troubles which are caused by lack of balance or overstrain on the bodily tissues, and explains the cause of many disabilities and deformities. These are commonly neglected and ignored by the physician until they become so pronounced as to be disabling. Don't you think they are worthy of a portion of your attention? The profession is skeptical, and ofttimes rightly so, but it is foolish to blind oneself to the truth. I am rather inclined to suspect that some of you would be tempted to smile if I called abdominal ptosis an orthopedic affection and suggested its being treated on those lines. To this I would reply, Stand a person so affected alongside of a well-trained soldier and note the difference in their attitudes! Can you imagine a soldier with his erect attitude and flat abdomen a victim of abdominal ptosis? No. Put your abdominal case through a course of training such as the soldier has gone through and see what would become of those relaxed suspensory ligaments of the displaced viscera.

Static troubles are interesting. They, like most orthopedic cases, are problems. Take them up with an analytical mind, search out their causes, and you will be gratified by the results you will be able to obtain. If a boy comes to you with flat feet, don't simply give him a supporting plate and then dismiss him, but inquire as to why he has the trouble and endeavor to eliminate the cause. Here is a large field for study; you need not have any great operative ability to do a great deal of good in it if you only choose to study it. You will desire practice, but how are you to obtain it if you allow such cases as these pass by you unrecognized and unhelped? This, however, is only one of many fields, practically untilled, awaiting your coming.

Another class of cases comprise the *congenital deformities*. Amongst the most common of these are club-feet, club-hands, supernumerary fingers and toes, web-fingers, torticollis or wryneck, congenital luxations of the hip, birth palsies, and others. It is indeed an assortment. Begin with club-feet: Perhaps the very first confinement you attend will present you with a pair of club-feet? What are you going to do? Flee? No; it is an orthopedic case, therefore there is no necessity for haste. Think it over, read it up carefully, and tackle it manfully. Tell the people to gently stretch the foot several times a day, and then retire gracefully and prepare yourself for the next move. The child is too young to render it advisable to do anything more for several weeks; by that time you will have learned that the mother can be taught to stretch the feet and bandage them nicely into a pair of simple tin splints. You show them how it is to be done, and you are safe for some months. Your next move will be more ambitious; you are gaining confidence. You say, "These feet are not doing as well as I wish them to; I will put them in plaster." This you do. Finally by the time the child is ready to put its feet under it to try to walk, you say, "Now that *we* have gotten the feet straight *we* will put on a pair of supports to keep them straight, and *we* will soon have him on his feet and walking around;" and so you will. Don't you see the more you know the more you can do? Don't sit in your empty office and rail at the specialties. If you cannot treat such cases yourself, of course you must send them elsewhere, but the specialist does not rely on such easy cases as that one. The case he gets is the one that no one wants and no one has taken care of, and it is an obstinate, obdurate, deformed one, that needs the resources of the most expert and puzzles the most skilful to conquer.

Club-hands will tax your ingenuity to the utmost. Torticollis needs to be recognized, and after ample conservative treatment can later if necessary be readily cured by an operation. Supernumerary digits like club-hands will give scope for all the operative and mechanical skill and ingenuity you possess. Congenital luxations of the hip *are* serious. It is your duty to recognize them and see that they are attended to. The bad

cases are usually those which are allowed to get too old before they come to us for treatment.

When a child otherwise healthy limps or has a waddling gait, examine it carefully and see whether its hips are normal. Female children are more apt to be affected than male. Sometimes only one hip is out, often both. It is easier to recognize when only one is luxated, because then the legs are uneven in length and you can determine this by simply measuring them—that is, if you know how to measure limbs. If, however, both are out, then detection is more difficult. Strip the child and see it walk. If both hips are out the attitude is almost pathognomonic. Note the protruding buttocks and wide-spreading trochanters; note especially the hollow back or lordosis; finally compare the level of the tip of the greater trochanter with that of the anterior superior spine of the ilium. You know that normally the inclination of the neck of the femur brings the tip of the trochanter quite a little distance below the level of the anterior superior spine. If the hip is luxated they will both be on the same level, and finally if you place the fingers of one hand on the tip of the greater trochanter and push and pull on the leg with the other you will feel the tip of the trochanter sliding up and down, showing that the joint is abnormally loose. In cases of doubt have an *x*-ray or Roentgenogram made, and that will show the true condition. Having once recognized the cause of the trouble you can then advise intelligently, and your duty will be done.

Finally, a word about birth palsies. This name leads one to suppose that they are nerve paralyses. They are due to some injury to the arm occurring during childbirth. In some cases they are true nerve injuries, but in others, and these include the bulk, they are articular injuries, as Dr. T. Turner Thomas has pointed out. Their treatment has as yet not been entirely worked out, but certain it is that a great deal can be done for them. You can, at all events, see first that the arm is not allowed to hang helplessly by the side, but is kept forward in a more normal position. In the meantime efforts by massage and training should be made to restore the lacking power. You need not be ashamed to seek further advice on this class of cases.

I cannot let the opportunity pass without saying a few words about rickets. Please learn to recognize the rachitic child. I know of no disease so often ignored as a causative factor of disabilities and deformities as rickets. You know as well as I do how common it is, so be on the watch for it. It causes flat-feet, bow-legs, knock-knee, pigeon and funnel chests; big heads; open fontanelles; swelled wrists and ankles; it delays walking; it delays talking; and is mistaken for almost everything under the sun. Recognize it; change the diet; keep the child in the open air; give it cod-liver oil; and the improvement will simply be marvelous. To recognize it is to cure it. It will add another patient to your practice, and a legitimate one, too. I cannot see how so many cases slip by the physician unrecognized. Does *it* belong to a specialty?

I have not yet gotten to the end of my string. There are many other orthopedic troubles, but time is short and life is fleeting.

In concluding I would say that in the time allotted to me it has been endeavored first to give you some idea as to what orthopedic surgery is and why the subject demands special study. There was pointed out to you how it differed from collateral branches and that those who practiced it undertook grave responsibilities. Although you may be inclined to think so, it has not been my intention to make a plea for the branch. It needs no excuses for existing; it seeks no favors. There is a homely saying that "you cannot keep the working man down," and if the character of the work appeals to you as it does to me you will need no urging and you cannot be suppressed. In order for you to better understand its scope and objects, and appreciate the broad principles which underlie its practice, allusion has briefly been made to some of the main classes of cases. In doing so the object has not been to teach you facts, but rather to give you some idea of how the subjects are to be studied and regarded

from an orthopedic standpoint. This is only one special line of study amongst many. It will not interest all of you, but to some, especially fitted both by taste and natural ability, endowed with the divine spark, it will appeal so strongly as to create a desire for a thorough knowledge of it. While all of you will be welcome, these I claim as brothers, and everything possible will be done to further their aims. My only regret is that I did not earlier specialize my work. The times, however, have changed. Orthopedic surgery is yet in its infancy; it will grow; its future is bright and full of promise. Its field is limitless and its possibilities boundless. You are young and vigorous; you have the world before you. Go forth and conquer!

THERAPEUTIC RESOURCES OF MODERN DERMATOLOGY.[1]

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The progress of medical research and its practical application in the last few decades has been so great and rapid; so many new ideas, observations, laboratory tests, and methods of treatment have been offered to the profession; the literature on all these subjects has grown to such enormous volume, that the average medical man is fairly overwhelmed by this scientific avalanche. No man at the present status of medical science can aspire to be conversant with all the new ideas and advances in all branches of medicine. In fact, even within special branches of medicine, it is getting harder and harder to be equally competent in the whole domain of the respective specialty. Thus a new subdivision of specialties results in carrying a differentiation of clinical medicine to a heretofore unknown extent. To remedy this condition, and to give a chance to the busy general man to catch up with the procession of medical progress, periodical surveys or, as it were, inventories of our scientific stock in different specialties would seem to be most advisable and feasible measures.

Dermatology was never popular with the profession, and until very lately was grossly neglected in the curriculum of medical colleges. Yet it can be truly said that hardly any other branch of clinical medicine has applied so many ideas of modern research, particularly so in the field of physiotherapeutics.

A full exposition of dermatological therapeutics obviously cannot be attempted in the space at my disposal, yet the general principles, with concrete illustrations of their application, the drugs and methods of treatment that proved efficacious in clinical experience, can be presented sufficiently so as to be of assistance to family practitioners.

Broadly speaking, dermatological therapeutics can be divided into two classes—constitutional and local. The rationale of constitutional treatment is based on a presumption that skin diseases are nothing but a local manifestation of a constitutional or metabolic disorder, and that the local lesions will take care of themselves if the etiological systemic factor at fault is eliminated. This idea, by the way, is extremely popular with the laity, who always insist on getting "a blood medicine" in all kinds of skin disorders. In fact, this idea has such a strong hold on the public mind that many people are reluctant to treat their skin diseases from fear of "driving them in," under the belief that they are better off while the eruption is out. It stands to reason that, by raising the general tonus of the patient and increasing his eliminative functions, we improve his chances of combating any local disease, be it in the skin or any other organ, and for this reason attention to the general condition of nutrition and elimination is to be encouraged in all persistent chronic skin diseases. Yet it has to be admitted that up to the present time constitutional treatment in skin diseases has been used on purely haphazard and problematical bases of assumption of autointoxication, trophoneu-

[1]Paper read on December 22, 1914, before the West End Medical Society, Cincinnati, Ohio.

rotic influences, and different diatheses, as uric, scrofulous, strumous, rheumatic. Taking, as an example, the most common skin disease, infantile eczema, we do not know as yet whether it is due to intolerance or superabundance of proteids, fat, or carbohydrates. As clinical experience has shown that no uniform type of diet answers all cases, possibly the true solution of this problem lies in individualization of these cases, assuming that various constituents of the diet may produce eczema in individual cases. In my judgment, routine indiscriminate and sweeping restrictions of diet to the point of caloric deficiency should be condemned, and individualization of the diet should be attempted. Should intestinal or metabolic toxemia be suspected as the underlying factor of skin disorders, a gradual and systematic elimination of certain groups or individual articles of food should be started. In this way a greater purity of observation will be secured, a firmer basis for deductions, and a better opportunity to trace up individual etiological factors of the case.

The etiological importance of constitutional factors in skin diseases is somewhat overestimated by the laity and profession alike. Direct etiological relationship between local lesions and systemic factors is best manifested in so-called symptomatic dermatoses, which are usually of acute character, symmetrical and universal in distribution. Such are the acute infectious exanthemata and drug eruptions. In skin affections limited in extent, with a few or single patches, it is natural to infer that besides constitutional predisposition there must be some local external or nutritive factors at work that render this particular area a place of the least resistance and limit to it manifestation of the systemic irritant. This contention is borne out by clinical evidence, that only in a very small minority of the cases can constitutional treatment alone clear up the local lesions. In the great majority of skin diseases local treatment is not only helpful but absolutely indispensable. The reason for it is probably to be sought in the peculiar exposed position of the skin in the human economy, which makes it possible for local pathological changes, once having been set in motion by a morbific impulse, to persist indefinitely even after the systemic factor at fault is eliminated. Thus, constitutional treatment in skin diseases is more to be depended upon in prevention of the recurrences than in clearing up the present local lesions. The indications and administration of constitutional treatment belong properly in the domain of internal medicine and can be dismissed here with remarks of general character.

Besides measures tending to improve the general condition of the patient, constitutional treatment comprises internal administration of drugs for the purpose of selective or indirect action on the skin lesions. Medication is admittedly the most unsatisfactory chapter in dermatology. We have no specifics, with the one single exception of the antisyphilitic triad—mercury, salvarsan, and iodide. Arsenic is the only drug that has been proven to exert a specific action of stimulation of the epithelial layers of the skin. This selective action, combined with the powerful stimulating and tonic effect on the general economy, renders indications for arsenic easily defined. Arsenic should never be given in acute or subacute conditions of the skin, but it is very valuable in the chronic persistent affections, particularly those associated with nervous debility, such as psoriasis, lichen planus, pemphigus, dermatitis herpetiformis. Probably the best form of administration is the hypodermic use of cacodylate of sodium, 0.1 to 0.2 per dose, three times a week. It should not be forgotten that prolonged use of arsenic may produce keratoses, with danger of late malignant degeneration.

Sulphur follows arsenic in popularity as a skin remedy. Yet, used internally, it is decidedly inferior in efficiency to local applications. Its clinical value is undoubtedly largely due to its distinct purgative action, though it must be admitted that a small amount of sulphur does reach the sebaceous glands, where it can exert a slight stimulating effect. Some clinicians still use it as sulphide of calcium for acne, furunculosis, and sycosis, but the majority abandon

its use more and more. There is one indication, though, where sulphur can be tried with great benefit, and this is in syphilis. Karl Bruck of Neisser's clinic has shown experimentally and clinically that sulphur is a decided antidote to mercury, by forming an insoluble and inabsorbable mercurial sulphide combination. Internal administration of sulphur in syphilis has proven to be of great assistance in the elimination of mercury from the system and in preventing mercurialism. The most convenient form of administration is in the form of sulphur-cream of tartar tablets, three to four times a day, in plenty of water.

A few other drugs have been suggested on theoretical grounds, to meet special dermatological indications. Ergot and ichthyol were proposed as vasomotor constringents in urticaria, acne rosacea, etc., but the results accomplished are decidedly inferior to those of local treatment.

Attempts at internal medication for relief of that specific dermatological symptom, itching, have also proved unsatisfactory, for the obvious reason that the skin nerves can be reached in a much nearer and more direct way by local applications, without saturating the whole system with drugs. As a general rule, opiates and morphine should never be used under any circumstances in skin diseases, not only because of the danger of the drug habit, but because they often increase itching instead of relieving it.

The most commonly used drugs are bromides, chloral, belladonna, phenacetine, and antipyrin. In my experience a combination of tincture of cannabis indica and tincture of gelsemium, 15 to 20 drops each, three or four times a day, proved to be very serviceable and advisable by its comparative safety.

The inefficiency of internal medication naturally led dermatological research into different channels, and under stimulation of the ideas of immunity and anaphylaxis it entered the field of vaccine and serum therapy. It is as yet in the experimental stage. Many connecting links of bacteriological evidence in various skin diseases are missing, yet what little has been accomplished clinically augurs well that dermatological therapeutics of the future will find, next to physiotherapy, its most fruitful field in serotherapy. The best clinical results are obtained in dermatoses produced by different strains of staphylococci, such as furunculosis, acne, sycosis, and many cases of pustular dermatitis. Stock vaccines in these cases are almost as efficient as autogenous. In acne, acne bacillus vaccine has to be added.

The technique of administration differs. Some, as Engman of St. Louis, prefer to give small doses of three millions at intervals of five to seven days. Others, as Gilchrist of Baltimore, give large doses of ten to twenty millions, waiting for the negative phase to subside before the next injection. It seems to me that better individualization of the cases would be obtained by adopting an intermediate method. I prefer to start from small doses, and if improvement does not follow slowly increase them, until negative, local, or constitutional reaction appears, indicating individual tolerance of the case.

Vaccine of staphylococci albus has proved to be very efficacious, in many cases of seborrheic dermatitis and dermatitis herpetiformis. While using vaccine, local treatment should not be omitted, since vaccine, as any other constitutional treatment, is of more value in preventing relapses than in clearing up the present lesions.

Besides vaccines proper, serum therapy in a broader sense, based on modern ideas of immunity, and anaphylactic properties of foreign blood serum were tested clinically for therapeutic purposes.

Thus Linser of Germany used human blood serum in obstinate cases of urticaria, prurigo, and eczema with very good results. Serum was given intravenously, 10 to 20 Cc. In a severe case of herpes of pregnancy the serum from a non-pregnant woman had no effect, but one injection of serum from a pregnant woman produced improvement. Another German, Spiethoff, has observed that venesection and reinjection of the blood or blood serum to the same patient induced less irritability of the skin, so that the cases could tolerate

much more intensive local treatment, which had previously produced acute inflammatory reaction.

Brief mention should be made about the latest attempt to introduce organotherapy in dermatology, on the assumption of deficiency of internal secretion of the ductless glands. Thus, thyroid is occasionally of value in some cases of psoriasis, urticaria, and dry chronic eczemas; ovarian extracts similarly may be tried in persistent scaly dermatoses, where disturbances of ovarian function are suspected; the pituitary gland is held responsible for certain cases of ichthyosis and hypertrichosis; and the suprarenal glands were advocated lately for treatment of vitiligo.

As mentioned before, these new clinical methods are as yet in the experimental stage, but they are of the greatest significance for the future development of dermatological therapeutics.

This briefly exhausts constitutional treatment of the skin diseases. Now we can turn to consideration of local treatment.

Local treatment can be broadly divided into two classes—drug applications and physiotherapeutic agents. Local drug therapeutics has been displaced to a great extent by the latest physiotherapeutics, yet it is extensively used, is perfectly sufficient in a large number of cases, and naturally will continue to be the main reliance of the general practitioner. The customary presentation of the drug treatment as a list of rigid formulas appended to each individual disease is entirely ineffective and useless, because it does not provide for individual variations of the cases. Clinical classification of skin diseases does not always coincide with the same pathology, the same clinical appearance, and accordingly with the same therapeutic indications. Therefore it seemed to me that for a general practitioner, who often has to treat a skin disease before he is in possession of an exact diagnosis, drugs for local application should be classified in a different way—namely, according to clinical effects produced by the drugs and therapeutic indications.

From this view-point the drugs could be classified as follows:

1. Detergent or cleansing.
2. Protective and coating.
3. Antipruritic.
4. Antiparasitic.
5. Absorptive and alterative.
6. Keratoplastic—keratolytic.
7. Cauterizing.

As a preliminary step for any other application, cleansing is the very foundation of dermatological treatment. Peculiarly the natural washing medium, water, has been condemned empirically by the laity and is regarded suspiciously by many practitioners. At the present time we limit the use of water in skin diseases only proportionately to the acuteness and intensity of inflammatory reaction. Of all skin diseases, eczema tolerates water the worst—particularly so in the acute and subacute stages. If we remember that eczema constitutes not more than 20 per cent of all skin diseases, it will be seen that in more than 80 per cent water is not only permissible, but useful and indispensable. The value of frequent washing and bathing is particularly great in chronic dry, scaly affections, as psoriasis, seborrhea, ichthyosis. Whenever water is contraindicated, bland oils and fats are substituted, as olive oil, almond oil, or vaselin. Possibly the best of all is liquid albolene, due to its chemical purity and lesser tendency to turn rancid. In other cases occasional washing is allowed after adding to the water certain substances that render it less irritating—such as starch, bran, sodium bicarbonate, or borax, half an ounce to a gallon. Soaps considerably intensify irritation by water and should be used guardedly. The mildest soaps are soda soap, of which Castile soap is representative; potash soap, of which green soap is a type, is much stronger in action, and for this reason used only for specific indication of dissolving grease, epithelial detritus, etc., and also for stimulating effects in sluggish skin affections with accumulation of secretions, such as acne, seborrhea, psoriasis, etc. It can be remarked here that medicated soaps on the market are entirely too weak to be relied upon for medicating purposes, and can be used merely for cleansing.

The next class of drugs for local applications, the largest and most frequently used, is soothing and protective: they are indicated in all conditions of acute and inflammatory character, and well illustrate the value of symptomatic treatment in skin diseases. Whether we know the etiological factor of the eruption or not, whether we are able to eliminate it or not, inflamed and irritated skin has to be protected from further irritation and scratching.

Protective applications can be in the form of dusting powders, lotions, or ointments. Powders have a rather limited field of usefulness. Their advantage is dryness and convenience of administration; their disadvantage, weakness of action and tendency to cake in weeping eruptions. They are used, therefore, only in superficial and dry dermatoses, as intertrigo, erythematous or papular eczema, hyperidrosis, etc. Any of the bland and non-irritating powders will do, provided they are well triturated and not gritty. Those most commonly used are zinc oxide, starch, lycopodium, rice, talcum, magnesium carbonate, etc.

Lotions are a very extensively used, clean form of administration, well liked by the patients. They are indicated in eruptions occupying a large surface of the body or on the scalp, and are particularly serviceable in weeping cases. Their active ingredient is usually an astringent. The most commonly used are zinc-calamine lotion, lotio nigra, Burrow's solution.

Zinc-calamine lotion consists of zinc and calamine 1 to 2 drachms to four ounces of water; lotio nigra—equal parts of water and lime-water with 2 to 4 per cent of calomel. Burrow's solution, of the German Pharmacopœia, is an extremely useful preparation; it consists of lead acetate 105.0, sodium sulphate 40.0, alum-potassium sulphate 372.0, distilled water sufficient to make 2000.0. It combines soothing, astringent, and mildly antiseptic action, and can be used in most acute conditions, diluting a tablespoonful in a glass of water. In vesicular and weeping eczema it is extremely serviceable to tide over the period of exudation, when the ointments can be started.

Ointments are the most popular form of cutaneous applications. A large number of them can be used for soothing and protective purposes. All of them are bland or astringent bases. Their advantage over lotions and powders is more intense action due to heavier coating. Their disadvantage is uncleanliness, necessitating painstaking cleansing. The most commonly used are zinc oxide ointment, boracic, Wilson's ointment, diachylon ointment, the usefulness of which is impaired by easy tendency to rancidity, rose-water ointment, commercially called cold cream, and Lassar paste. Lassar paste is the most important and useful preparation of all and should be familiar to every practitioner. It consists of zinc oxide and starch, equal parts, say 15.0 each, and lanolin and vaselin, each double the amount of the previously named ingredients. This is the so-called original Lassar paste, and when prescribing it, it is advisable to write out the full formula, as druggists commonly dispense modified Lassar paste, containing salicylic acid and sulphur, which naturally would increase irritation instead of allaying it. All the preparations mentioned here, and quite a number of others, have in a general way similar soothing effects in acute inflammatory conditions and can be substituted one for another to a great extent. Yet the therapeutic nihilist notwithstanding, I believe it is of distinct advantage for us to have a variety of preparations with similar effects, as the skin in health, and particularly so in a disease, exhibits considerable variation in tolerance of and resistance to different drugs; and a larger variety of drugs to choose from to meet individual cases must undoubtedly increase our efficiency. All or most of the soothing and protective ointments are used as bases or vehicles for incorporation of different drugs for special purposes.

Next in importance is a group of antipruritic applications. In no class of diseases is symptomatic treatment so well justified and of such importance as in skin diseases. The difficulty of self-control on the part of the patients in abstaining from scratching, and the peculiar tendency of itching and scratching to create a vicious

circle, where one intensifies and induces the other, makes symptomatic relief an absolute necessity in all cases. Antipruritics are all irritating and cannot be used in acute conditions, where soothing and protective applications are usually sufficient to give relief.

The best representative of this class is phenol, which acts as an anesthetic directly on the nerve in the skin endings. It is used in lotions or ointments 1 to 2 per cent strong. Similarly efficient is its chemical derivative, liquor carbonis detergens, which is a solution of coal tar in alcoholic extract of soap-bark, used in 1 to 5 per cent strength. Next in frequency of use are thymol and menthol, which relieve itching by substituting a sensation of cold, used in 1 to 3 per cent strength. Better than both of these is diluted hydrocyanic acid, in 1 to 2 per cent solution.

All these antipruritic remedies are very useful in the general run of cases, but it must be admitted that in severe cases of pruritus, primary or symptomatic, they fail, and then we have to resort to the most powerful antipruritics at our command, the physiotherapeutic agents, to be discussed later.

The next group is the antiparasitic applications. In dermatoses due to animal parasites, as scabies and pediculosis, their action is specific. The classical remedy for animal parasites is sulphur, which can be used in lotions or ointments. The best preparation is Wilkinson's ointment, combining the effect of sulphur, tar, and green soap. Betanaphthol, 4 to 8 per cent, is also very efficacious; balsams Peru and styrax are also good, but milder in action, and for this reason are preferable for use in children. In dermatoses due to vegetable parasites, as favus, ringworm, staphylococci infections, actinomycosis or blastomycosis, the action is specific only in superficial forms. In these cases any of the mentioned antiparasitics, and also a large number of surgical antiseptics, can be used. Tr. iodi, bichloride solution, any mercurial ointment, salicylic acid, potassium permanganate, guaiacol, in lotions or ointments, are all efficient; but in cases involving deeper tissues or hair follicles, none of these applications, regardless of the strength, penetrate deeply enough, and radical cure is obtained only with *x*-ray or vaccine therapy.

The next group, clinically very important, stimulating or alterative, is used in a very large number of chronic, dry, sluggish dermatoses, to promote the absorption of the exudate and clogged-up secretions. Most probably all drugs of this character do not have any specific alterative or nutritive action on the tissues, and act mainly through inducing hyperemia and improving circulation. From this standpoint a large number of drugs could be used for the purpose, but empirically only a few drugs have been found efficient, and have been adopted in clinical use. These are tar, sulphur, betanaphthol, resorcin, salicylic acid, chrysarobin, ichthyol. All of these drugs are strong irritants, and as a routine have to be started from weak concentration and cautiously increased until the tolerance of the skin is determined. Tar is used as oil of cade—incorporated in ointments—with Lassar paste or other base, 2 to 10 per cent, usually in chronic eczemas, psoriasis, lichen planus, etc. If tar is not tolerated, betanaphthol about in the same proportions should be tried. Sulphur, besides being, as mentioned before, a powerful antiparasitic, is a strong stimulant for the skin and especially for the sebaceous glands, and is one of our best remedies in chronic dermatoses of follicular character, as acne and seborrhea. It can be used as an ointment 1 to 15 per cent. It is still better used as a lotion, under the name lotio alba, representing about 4 per cent combination of zinc sulphate and potassium sulphuret, the sulphur in the nascent state forming by chemical reaction. Still more powerful, it can be used as Vlemingkx's solution, representing 8 per cent of sulphur precipitate in lime-water, one tablespoonful in glass of water.

Resorcin and salicylic acid are much milder stimulants and possess also marked keratolytic action in strong concentration, 5 to 15 per cent, while in weak concentration, 1 to 3 per cent, they rather promote formation of horny epithelium. Salicylic acid has a particularly selective keratolytic

action, and is used in different callosities and hyperkeratotic conditions, usually with green soap. Resorcin is very serviceable in many conditions, and particularly in seborrhea, but it should not be forgotten that it may stain blond hair green.

Chrysarobin is a powerful stimulant and has proven its efficiency, particularly in psoriasis. Concentration used, 6 to 12 per cent. The disadvantages of chrysarobin are permanent staining of the garments and a tendency to produce severe conjunctivitis. For this reason it is never used on the scalp or face, and is substituted here by resorcin, salicylic acid, or mercury ammoniate (white precipitate) ointment.

Pyrogallic acid is also a powerful stimulant and used occasionally in psoriasis and other chronic dermatoses, but it is used mainly in very high concentration (15 to 25 per cent) for destructive action, and properly belongs to the next group—cauterizing.

The cauterizing group has been largely displaced by modern physiotherapeutic methods. Clinically, cauterizing is indicated in all local growths or granulomata, benign or malignant, comprising warts, nevi, pigmented or vascular, skin tuberculosis, epitheliomata, etc. For superficial cauterizing, as in seborrheic or juvenile warts, pigmented or vascular nevi, nothing is better, in my opinion, than concentrated trichloracetic acid. Its penetration is not deep, and leaves no scars, even in tender, childish skin, but by repeated application a penetration to any desired depth can be reached.

Pyrogallic acid, mentioned above, occupies the middle ground between superficial and deep cauterizing. It has the advantage of selective action on pathologic tissue only, used commonly in 25-per-cent strength in lupus vulgaris. Lactic acid in full strength exerts a similar action and is used occasionally in lupus.

Deep cauterization—indicated in malignant growths and lupus—is effected by zinc chlorate and caustic potash; but either of these two is intensely painful, highly destructive, and irritating; they cannot be limited in degree of penetration and destroy healthy as well as pathological tissue.

Arsenic remains our best local cauterizing agent, combining sufficient penetration and selective action of sparing healthy tissue. It is used commonly as paste with gum acacia, 50-per-cent strong, incorporating cocaine to lessen the pain. In selected cases of epitheliomata, where the *x*-ray or operation is unavailable or contraindicated, arsenic paste is worthy of trial.

This closes the survey of the most useful local drug applications in skin diseases. It has been dwelt upon at greater length for the reason that drugs are the natural reliance of every practitioner and are likely to be their first resort.

The physiotherapeutic methods, which require a special equipment and training, will now be considered in the briefest possible terms, just to point out their clinical indications, their relative value, and the general principles of their action. From various physical agents electricity proper has found the least application in dermatology. The faradic current, which theoretically could be expected to exert a stimulating and nutritive effect on the skin, has not been adopted for clinical use. The galvanic current has a very limited field of usefulness, mainly in electrolysis, for cauterization and destruction of superficial pigmented and vascular nevi—telangiectasis—warts, and, foremost of all, for removal of superfluous hair, in which it is superior to any other method, though tedious and time-consuming.

Attempts to introduce drugs into the skin through electric cataphoresis have not so far given encouraging results.

Among various kinds of electricity, possibly one of the most interesting is the high-frequency current. High-frequency currents were introduced into medicine in 1903, and yet our knowledge about their pathological and clinical properties and our control over them in measuring and administration are less than in any other modern physiotherapeutic agent. It has been my privilege to test clinically the high-frequency current for the last year and a half in large series of various skin affections. While I have to admit being disappointed in some of the results, I feel justified in giving the most enthusiastic and hearty ap-

proval of its use, at least in one clinical indication, which is of paramount interest in the average skin case—this is relief of itching. As an antipruritic it has invariably given symptomatic relief in numerous cases of chronic eczema, lichen, urticaria, senile and nervous pruritus. The technique is simplicity itself, and consists in passing a high-frequency electrode over the itching area, in direct contact, occasionally lifting it from the skin, for ten to fifteen minutes, once or twice a day. It must be kept in mind that there are two kinds of high-frequency electrodes, one yielding a pink and the other a bluish-white glow. The pink electrode produces a lower degree of vacuum, and has a more soothing effect, while the bluish-white has a higher vacuum and has a more stimulating effect. The only rival of the high-frequency current as an antipruritic is the *x*-ray. Comparison between these two agents in facility of equipment, simplicity of technique, safety and rapidity of administration, easily renders high-frequency the method of choice and an invaluable part of the equipment of every practitioner. Lest it be misunderstood, let me repeat that the high-frequency current does not cure the disease except in certain selective cases, but relieves symptoms of itching, and tides over the patient until radical treatment can be instituted and give effect.

Among the physical agents introduced into dermatological therapeutics recently, both cold and heat were pressed into service. Cold was originally introduced for the effect of freezing cauterization in the form of liquid air, but this proved to be technically impractical, and it was replaced by a discovery of Pusey of Chicago—carbon dioxide snow. The mode of its action is producing coagulative necrosis with subsequent fibrosis. Clinically it has proven very serviceable in cases of superficial angiomata, thick pigmented nevi, and lupus erythematosus. While in selective cases carbon dioxide snow undoubtedly gives splendid results, it is irritating, often produces violent reaction, and has to be used with caution. I personally prefer to try out first trichloracetic acid, which is safe, mild in action, and gives splendid cosmetic results.

Heat was introduced into dermatological therapeutics considerably later than carbonic snow (in 1911). It has been tested clinically by Lutembacher of Paris, France, and Esau in München, Germany. These observers found that superheated air at 140° F., used as a prolonged douche, has marked antipruritic effect—results that should not be surprising, as it is an old empirical observation that the heat exerts striking analgesic and soothing effects. At a temperature of 140° to 180° these observers have seen hyperemia, with subsequent stimulation of chronic cutaneous conditions. At the incredible temperature of 1200° to 1500° F., superheated air proved to be, under local anesthesia, a splendid cauterizing agent in various epitheliomata and lupus. Unfortunately, due to technical difficulties, this method did not go beyond the limits of experiment.

Actinotherapy, based on the chemical action of ultraviolet rays, was introduced into dermatology by Finsen, and was used most successfully in lupus, but, due to expensive equipment and unusually great length of time necessary for cure in extensive cases, it did not become popular, at least in this country, and has almost been supplanted by the *x*-ray. Modifications of Finsen light, particularly Kromayer's quartz mercury vapor lamp, have found more favor, but have also the disadvantage of requiring long time exposures.

We now come to the consideration of the most important therapeutic agent of all in modern dermatology—the *x*-ray. It can be truly said that the *x*-ray has completely revolutionized dermatological therapeutics. Many and many skin diseases that were considered incurable and entirely beyond our control are now most amenable and responsive to treatment. Distressing and persistent cases of eczema, sycosis, deep-seated ringworm, mycosis fungoides, lupus, and epithelioma, of many months' and years' duration, melt away in as many weeks or months under well measured and timed exposures. With the extension of our knowledge we have learned to get better results in a smaller number of exposures and with greater safety to operator and to

patient. The very latest advance in this direction is a method of measured and massive doses, giving in exact units hardness or penetration of the *x*-rays emitted by the tube, and actual amount of *x*-ray administered. The clinical importance of this discovery is tremendous, as it gives us at last a perfect means of checking up the maximum amount of *x*-ray we want to administer, and thus to prevent a burn. But introduction of measured doses as a routine work is not accepted yet by many dermatologists, not only because of the complex technique (containing many possibilities of errors due to change of the pastilles measuring ray and to individual interpretation in reading them), but mainly because it forces mechanical units of measure on clinical work and ignores individual resistance of cases. I believe the controversy can be ended by resorting to measured and massive doses in cases requiring intensive treatment, as in epitheliomata, lupus, ringworm of the scalp, mycosis fungoides, sycosis, etc., while cases of eczema, acne, pruritus, psoriasis, particularly in localities with tender skin, can be treated better with the old method of fractional clinically defined doses. The *x*-ray at the present time is the most potent single remedy in dermatology, and with careful operation and discriminate judgment its application can be pronounced perfectly safe for all practical purposes of therapeutic work.

This review would be incomplete without reference to the very latest and greatest achievement of modern research—radium. The clinical use of radium is still in the experimental stage, and final judgment as to the validity of its claims necessarily has to be deferred until later. I wish to touch only upon its probable relative position in the future to *x*-rays in dermatology. While in selective cases of malignant neoplasms *x*-rays will undoubtedly be supplanted by radium, it is safe to say that the bulk of dermatological work will remain a domain of *x*-rays, not only because of the prohibitive price of radium, but mainly because radium is peculiarly adapted for deep radiation of limited-in-extent masses, and not suited for use on extensive surfaces and for superficial mild effects.

This closes a necessarily brief review of dermatological therapeutics. That the exposition of such a vast subject in the space at my disposal is bound to be superficial and deficient is natural, and due apology is offered. It may be that some of the clinical suggestions and tabulations of different drugs and methods in their relative clinical values will prove to be of assistance, but this is an incidental feature of my paper. The main purpose of this writing was to point out its steady and rapid progress, to rehabilitate dermatology from its old-time estimation in the minds of general practitioners, and to emphasize the claims of modern dermatology to a place of equality among her sister branches of clinical medicine.

22 W. 7TH STREET, CINCINNATI.

PITUITARY EXTRACT AS A GALACTAGOGUE.

BY R. C. HUGHES, M.D., PAOLI, PENNSYLVANIA.

About two years ago after becoming dissatisfied in my efforts to induce lactation in women whose milk was deficient I decided to use pituitary extract, and from the first was greatly impressed both with the promptness and reliability with which the drug acted. I have been using the drug routinely whenever indicated ever since, and employ it with as great confidence as I do ergot to cause contraction of the uterus after labor.

Some months ago I read a paper before the Chester County Medical Society in which I reported my experience with pituitary extract as a galactagogue.

I have also spoken to some of my friends, who have informed me that they had little experience with the drug, and that had not been encouraging. I wish to relate two cases of especial interest to me:

Case 1.—Mrs. F. First child born fifteen months before I was called to attend her in

confinement. Had enough milk to nurse baby until she resumed her usual duties. Then her milk ceased almost entirely, and the child was fed artificially, with very poor result, as the mother informed me that it had never been very well and in constant need of medical advice and attention.

I attended the patient during the second labor, and as soon as she left her bed the milk ceased as in her previous experience, but promptly returned, and she continued nursing the baby satisfactorily after beginning the use of pituitary extract. The secretion continued abundant until the end of the fourth or fifth month, when she again noticed decided diminution in the milk secretion. I again prescribed the extract, with a prompt and lasting increase in the secretion. The patient is very positive concerning the beneficial effect of the drug in her case.

At the age of nine months her baby was as heavy as and far healthier than her first baby, over twice as old.

Case 2.—Multipara, aged forty-five; fifth child. Owing to scanty milk secretion it seemed probable that it would be necessary to feed the baby artificially. Pituitary extract was prescribed, and a very satisfactory increase of secretion obtained. The patient's husband is overseer of a fancy stock farm. She was so pleased that she made the following remark: "My husband states that he would like to have some of the same drug for some of his cows with which he was trying to make a milk record." Inasmuch as the patient is quite intelligent I gave her experience considerable weight.

At the present date I have two patients under my care for whom I have prescribed this drug as a galactagogue.

Both patients state positively that the drug has a marked effect. This has been the testimony of most patients who have taken the drug.

In conclusion I would state the following:

1. In my experience the drug has proven very valuable and to be depended upon.

2. I have not noted unpleasant clinical phenomena, although the drug has in some cases been taken for as long a period as two weeks or more.

3. The drug has had not only a temporary but a permanent effect.

4. The failures generally occurred in cases of the poor, who would not follow instructions.

5. As I am a general practitioner and only saw some of the patients at lengthy intervals, the blood-pressure and other laboratory tests were not made and only the clinical phenomena noted.

6. My friends who have found the extract inefficient used it only hypodermically, and then only one or two doses.

TWILIGHT SLEEP IN THE HOME.

The *Medical Record* of January 23, 1915, contains an article by JUNOR with this interesting title. His experience seems to differ somewhat from that of other clinicians. He believes that twilight sleep is rendered much safer and more effective by the addition of sulphate of sparteine. The most serious objection so far offered against twilight sleep is the danger of flushing in the mother, an indication of more or less interference with circulation; and, as sequelæ, cyanosis and suffocation in the child. Sparteine, which is one of the greatest diuretics and heart tonics known, and has the specific effect of equalizing circulation, naturally prevents these untoward conditions.

Believing this treatment, with the added employment of sparteine, a valuable addition to obstetric practice, the writer resolved to test its application in the case of labor in an ordinary home, and under ordinary conditions, it not having been as yet administered outside of a hospital. It was entirely successful, even without a graduate nurse. He ought to say that he escaped any cyanosis either in the mother or in the child, although the conditions were such that cyanosis in the child would have been a certainty under the conditions of ordinary labor. The tendency in modern medical practice is too much toward making technique so difficult that it can be carried out only in a hospital. Thus the ordinary fam-

ily physician is discouraged from undertaking many advanced relief measures which he is really fully capable of carrying out with entire success.

With proper care the twilight sleep treatment, to the doctor who understands his business, is simple and perfectly safe for the patient; it does not interfere with the natural course of labor; it does not make a difficult labor any less difficult. It does relieve the mother from suffering in difficult labor; there lies its value. The nervous shock accompanying such labors, from which often the patient does not recover for weeks, is avoided by this method.

The writer firmly believes that the introduction of such amelioration of the pains of childbirth, and the removal of the dread of it, will go far to restore the birth-rate, and, as well, modify prenatal influences now injurious to our children. Mothers, however, should not be encouraged to entertain the idea that twilight sleep or anything else is going to remove the troubles of childbearing, but only to ameliorate them. There is good evidence for believing that the addition of sparteine sulphate to the armamentarium of the twilight sleep, here recommended, is a distinct advance. In all probability it reduces narcosis amnesia, and unconsciousness permits analgesia to the abolition of any suffering, securing on the whole such a complete reduction of shock that the patient emerges without exhaustion or impaired vitality.

One of the writer's most recent cases shows well how this method secures unimpaired vitality after labor.

He arrived at the patient's side to find her in a faint from exhaustion caused by the preliminary pains. He put her at once to bed and administered 1 grain of sparteine sulphate, 1½ Cc. of scopolamine, and 1 Cc. of narcophen. The pulse and respiration remained normal during the entire labor. She dozed or slept between the pains. She did not change her position during labor. The writer was obliged to ask her to let him know when the pains were coming, that he might measure their strength and efficiency. They were both strong and very efficient, as is indicated by the fact that he was only three hours in the house, leaving a perfectly happy and unexhausted mother, and a normal baby of eight and three-quarters pounds. There had been no amnesia, light sleep between pains, consciousness of labor, except of the third stage (when a few whiffs of chloroform were given), but no suffering at all. Surely this is ideal. This patient's three previous labors had all lasted over ten hours, and left her completely exhausted. The writer firmly believes this treatment of labor ranks as one of the greatest advances in medicine, as well as one of the greatest boons of the race, largely because it promises for a better race.

Twilight sleep requires a more continuous presence of the attending physician; this is undoubtedly a favorable condition in labor, necessitating as it does more care and supervision. What the writer considers one of the valuable, though incidental, consequences of this treatment will be the restoration of confidence in as well as the more careful study of drugs, and their more scientific use.

The question of amnesia is not of so much importance as its advocates claim. The writer believes too much importance has been attached to this condition of the abolition of memory. To his mind it makes little difference, so long as there is no sense of suffering, whether the patient remembers the things that have happened or not. It seems to him that this is also one of the things that is of too fanciful a character, like its name, partaking too little of the scientific to be readily accepted by a professional man. Practically he has found the twilight sleep entirely satisfactory without amnesia. He is not sure whether this condition may not be obviated by the use, as he has suggested, of the sulphate of sparteine. There is a possibility of a desire to carry the anesthesia and amnesia to an extreme. Twilight sleep should be emphasized as simply and solely an amelioration of the suffering accompanying childbirth—not its entire abolition.

EDITORIAL.

ARTIFICIAL PNEUMOTHORAX.

Whenever opportunity has arisen we have endeavored to keep our readers informed as to the exact status of this comparatively recent method of treating pulmonary tuberculosis. From time to time we have published in the Progress columns of the GAZETTE abstracts from contributions made by various clinicians in this country and abroad, all of which have indicated that this procedure is of definite therapeutic value, although, like all methods of treatment, it cannot be applied universally, and if carelessly or wrongly employed cannot fail to produce deleterious or even disastrous results. The method is of peculiar interest because it would seem to offer much in the treatment of cases which are so far advanced that they are inevitably doomed unless some radical measure is taken for their relief. Not that it will save the lives of those who are far advanced in pulmonary tuberculosis in every instance, but that it will do so sometimes, and in a very considerable proportion of cases materially modify the symptoms and discomforts from which the patient suffers.

Recent investigations have seemed to prove that the law governing the diffusion of gases holds true as constantly in the induction of artificial pneumothorax as in other instances, and that nitrogen gas, which has been so largely employed, because it was supposed to be absorbed more slowly than atmospheric air, is really absorbed quite as rapidly, the different results so far obtained depending rather upon the condition of the individual patient than upon any difference in the absorption of the gas.

It having been pretty well determined that artificial pneumothorax may be employed advantageously in cases with a single large cavity, or multiple cavities, and also for the control of hemoptysis, unless the adhesions bind the lung to the chest wall so that an efficient collapse cannot be induced, it is important that we should have a clear understanding of the other contraindications and of the evils which sometimes result from the employment of this plan of treatment.

A very good summarization of this matter is contributed by Balboni to the *Boston Medical and Surgical Journal* of December 24, 1914. He points out that in some instances hemorrhage due to puncture of the lung has been induced; that in other instances subcutaneous emphysema has developed, due either to the employment of too large a needle, the injection of the gas at too high a pressure, to excessive thinness of the subject, or to a paroxysm of coughing following the injection, whereby the gas is forced out into the tissues of the chest wall. Occasionally pneumothorax from puncture or rupture of the lung is induced, but this is unlikely to occur unless the needle, having entered the lung, is moved about so freely as to produce a very large pulmonary wound. There are also some cases in which emphysema of the mediastinal tissues has occurred, the gas reaching the root of the lung by way of the peribronchial and perivascular tissues. In all instances after the first injection an *x*-ray should be employed to determine the amount of pulmonary collapse which has taken place, not only to discover how satisfactory the injection has been, but also to determine whether a large part of the gas has rapidly escaped from the pleural cavity.

Another complication which has sometimes ensued has been due to the so-called pleural reflex, that condition which is met with in a case of empyema when the surgeon irrigates the thoracic cavity, characterized by a convulsive seizure, loss of consciousness, and sudden death. Balboni believes that such accidents can always be avoided by a preliminary hypodermic injection of morphine, or by the injection into the chest wall beforehand at the site of puncture of a solution of novocaine-adrenalin. It is interesting to note that some patients who present the most alarming symptoms of pleural reflex recover.

In some instances it would seem that the injections induce an increased toxemia, and in still others it is possible that the inadvertent puncture of a vein may result in an embolism. Readers of the GAZETTE will remember that we have shown that the danger of gas, or air, embolism is not as great as we at one time believed it to be.

In some patients infection of the pleura has occurred either because the instruments have not been sterilized, the skin has not been properly prepared, or the hands of the operator have not been clean. So, too, a serous pleural effusion has not infrequently occurred. Concerning the importance of this effusion Balboni uses these words italicized:

"I consider these effusions to be unfavorable complications in that the presence of a large number of tubercle bacilli in the pleural cavity increases the absorption of toxins; nevertheless they must be interfered with as little as possible unless they become too large, or show continued unfavorable symptoms, such as continued pyrexia, marked distress, and disturbance to the adjacent organs, or its character changes from serous to purulent. Danger of infection becomes greater at secondary injections, as the fluid is an excellent culture medium."

In still other instances the effusion becomes purulent, and pain due to the separation of the pleural surfaces and the stretching of adhesions may at times be severe, and possibly may have to be combated with morphine.

Lastly, so far as accidents or complications are concerned it is interesting to note that patients not infrequently lose weight after the treatment is instituted, although they soon begin to regain weight if it is successful.

As a very considerable number of the cases treated by Balboni were at home, the results which he has obtained have more than ordinary interest for the general practitioner. At the same time it is not improper to state once more that this plan is not one which is to be entered into lightly, but only after a careful study of the needs of the particular patient in hand.

THE TREATMENT OF CHOLERA BY ADRENALIN.

We still know so little in regard to the ultimate effects of the various internal secretions upon the human body in health that it is difficult for us to determine their exact advantages and disadvantages in the presence of disease, the more so because it is becoming increasingly evident that the internal secretions of more than one gland are materially altered when disease is present. The secretions of all these glands interlock so closely that it is often unnecessary or unwise to add to natural secretions the internal secretions derived from the glands of animals. The field in which some of these internal secretions is being used is, however, constantly widening, and possibly more is being done in Europe in regard to the study of their effects in disease than in America.

Within a comparatively short time a number of papers have appeared concerning the value of adrenalin in the treatment of cholera, and in *La Presse Médicale* of December 10, 1914, Naamé tells us that he has read with great interest an article by Lagane on the "Prophylaxis and Treatment of Cholera" which appeared in the same journal of November 5, 1914. He regrets that the author did not mention the treatment of cholera with adrenalin, a method of treatment which has been employed with success by others. Analyzing the symptoms of cholera he finds that they chiefly consist in vomiting, sweats, the algid stage, cramps, and a low arterial tension, all of which are dependent on the infection with the specific organism, and all of which are in one sense somewhat represented by the conditions in which there is a lack of secretion on the part of the suprarenal glands. He has shown, he thinks, that patients suffering from Asiatic cholera are able to tolerate massive doses of adrenalin with advantage, and he employs hypodermically from four to six milligrammes in the twenty-four hours, placing the drug in normal salt solution. The adrenalin combats all the symptoms of lack of suprarenal secretion that have just been named, and yet in no way

prevents the employment of other measures which may be taken for the relief of the patient.

Naamé believes that such uses of adrenalin are indicated in the treatment of other diseases characterized by low pressure, as diphtheria and typhoid fever.

INTRAVENOUS AND SUBCUTANEOUS INJECTIONS IN THEIR RELATION TO BLOOD-PRESSURE.

There seems to be a widely diffused idea that subcutaneous and intravenous injections of normal salt solution may, under certain circumstances, do harm by raising the blood-pressure and thereby increase the labor of the heart, or the view is held that the greater bulk of circulating fluid, by increasing cardiac labor, may exercise a deleterious effect. Both of these views may be fairly stated to be entirely erroneous. In the first place every text-book of physiology emphasizes the fact that the vascular system of the body is capable, if relaxed, of holding many times the amount of fluid which it ordinarily contains. It has been estimated that the capillaries are capable of containing eight hundred times as much blood as the arterial system proper, and it is impossible to inject a sufficient amount of salt solution into the veins of an animal to cause a rise of blood-pressure by reason of the increased bulk of the circulation, because, with every drachm of salt solution that enters, the vascular system adjusts itself to its greater content and thereby maintains a constant degree of pressure. As soon as the amount of fluid in the veins is in excess of that which is needed by the economy, the blood-vessels are relieved by polyuria, or, if the kidneys are incompetent to give this relief, the liquid passes out into the great serous cavities of the body and into the connective tissue, where it is stored until the kidneys and the bowels can catch up in the process of elimination. Any rise of blood-pressure which takes place after the intravenous or subcutaneous injection of normal salt solution is due to the stimulating effect of the heat in the solution, or to the stimulating effect of the salts which it contains, these salts acting directly upon the blood-vessels, or by providing the vasomotor centers with a better blood supply, enabling them to perform their function more efficiently.

One of the advantages of subcutaneous injections over intravenous injections is that the system can then take from the artificial reservoir, which is produced in the subcutaneous tissues, as much fluid as it needs without being in danger of being drowned out, for if the body already contains an excess of liquid, transudation not only takes place into the serous cavities and into the connective tissues, but into the lungs as well, so that a condition closely allied, if not identical, with pulmonary edema is induced. Indeed, it may be stated that the presence of a considerable number of moist râles at the base of the lungs is rather a contraindication to intravenous injection and perhaps to hypodermoclysis, rather than an indication for their use, and particularly is this true if there is reason to believe that a subacute or chronic nephritis is present.

We have repeatedly emphasized in these pages that the factor of greatest importance is to see to it that the strength, or tonicity, of the solution is accurately determined. Many physicians seem to be forgetful of the fact that if the salt solution is hypertonic, or above 0.9 per cent, such a solution is not absorbed but takes to itself fluid from the tissues until its tonicity is identical with that of the tissues, and that conversely when a hypotonic solution is injected it abstracts salts from the tissues until it is isotonic. In other words, the employment of salt solution is based upon the laws of osmosis, and these are physical laws, and laws to which there is no exception, in distinction from a physiological process, which may vary widely according to the condition of the individual.

It not infrequently happens that a nurse or physician prepares normal salt solution, so-called, by adding a teaspoonful of common table salt to a pint of water. This teaspoonful in the hands of one person is an even teaspoonful; in another it is a heaping teaspoonful; and in a third it is, if pos-

sible, more than a heaping teaspoonful. The solution so prepared may in one instance be practically twice as strong as it is in another case. If the heaping teaspoonful is used the fluid placed under the skin is not taken up until it in turn has taken enough fluid from the tissues to reduce its tonicity. Furthermore a drachm of sodium chloride, even if accurately measured, does not produce, strictly speaking, a normal salt solution, since such a solution contains only one of the salts which should be present if a truly normal salt solution is desired. Calcium chloride and potassium chloride must also be placed in it if it is to be distinctly valuable to the patient. As the ingredients for such a normal salt solution already sterilized can be obtained in any well-equipped drug store, carefully measured, and in hermetically sealed containers, there is no excuse for the employment of salt solution which is not really standardized. Lack of care in regard to this important matter is often responsible for failure in the face of urgent conditions which demand the greatest skill and accuracy. These facts were impressed upon us forcibly by investigations made when under Ludwig in the Physiological Laboratory in the University of Leipsic in 1886. They can be beautifully demonstrated by the circulation of salt solution of varying strength through the amputated limb of an animal recently killed. If a strong salt solution is used the limb becomes shriveled by the abstraction of its liquid; if a weak solution is used it becomes swollen to two or three times the natural size by the passage of liquid into its tissues.

We are glad to note that this subject has once more been brought before the profession by Hogan of San Francisco in the *Lancet-Clinic* of January 2, 1915.

GASTRIC ULCER AND CANCER.

From systematic records of clinical material and a combined study of the pathology of the operating table, the so-called living pathology, with that of the cases which terminate fatally either with or without operation, conclusions may be drawn of equal practical value both from the diagnostic and therapeutic standpoint.

In Smithies' study (*Interstate Medical Journal,* March, 1915) of five hundred gastric ulcers (Mayo Clinic, Augustana Hospital) it is shown that gastric ulcer is less frequent than duodenal, that the greatest number of cases occur between the ages of forty and fifty years, that there were two males to each female afflicted, and that in males the greatest number of ulcers occurred at a decade older than was observed in females.

A previous typhoid was noted in 17 per cent of cases, and appendicitis and cholecystitis were associated conditions in about half.

The most striking clinical feature of the disease exhibited by two-thirds of the cases is its symptom-periodicity; by this is meant that discomfort occurs intermittently, in "spells" or "attacks." Between such periods there is good gastric health. The spells may be distinctly seasonal—spring and fall being favorite times. More than half the cases were dyspeptics for from five to twenty years before operation. Weight was not infrequently lost during spells, to be rapidly gained as soon as abdominal distress subsided. The weight lost was rarely associated with cachexia. The gain when the attack passed was often astonishingly rapid. There was often associated anemia even in the absence of hemorrhage.

In 98 per cent of the cases some form of gastric distress was noticed, which varied from vague discomfort to a burning feeling, gnawing, dull ache, or soreness. In about 20 per cent of cases colicky attacks were observed, described as tearing, doubling up, cramping, or piercing. They were so severe as to require opiates in 9.4 per cent of cases. The pain was usually epigastric without definite points of intensity. A small percentage had distress in the small of the back. Referred pain was noted in the right scapular region, the right rib edge, below the navel, between the scapulæ, behind the sternum, in the throat, and about the nipples.

In 83 per cent of cases pain and distress had definite relation to food ingestion, occuring as a rule within three or four hours after taking food. In uncomplicated ulcers pain came on sooner after a light meal than after a large one. Nearly two-thirds of the ulcers located near the cardia exhibited maximum distress within two hours following food intake, and two out of five within one hour. The observation of relief of gastric distress by food ingestion is of prime importance in diagnosis of uncomplicated peptic ulcer. If its history is constantly obtained, it is practically pathognomonic in three out of five cases.

Seventy-four per cent of the cases gave a history of vomiting, dependent largely upon the character of the food intake, the solids producing this symptom more regularly than the liquids. At times of acute exacerbation of distress the factor of gastric or pyloric spasm proved an important cause for emesis. At such periods even non-obstructive ulcers frequently gave similar vomit pictures to those characteristic of anatomic obstruction.

"Delayed" vomiting—that is, vomiting of food that has lain in the stomach for from eight hours to several days—was exhibited by 22 per cent of the ulcers forming the non-obstructing group and by 68 per cent of those where ulcer scar caused some type of stenosis. Cases exhibiting "delayed" vomiting showed varying degrees of gastric dilatation in nearly eight out of ten instances. They had frequently been treated for such. It should be emphasized that only rarely is dilatation of the stomach a disease *per se*. It is practically always but a symptom. When searched for its cause is usually readily determined.

Pyrosis, eructations, or water-brash were noted in 82 per cent of cases. A history of gross bleeding was obtained in over 36 per cent. In general, melena alone means the ulcer is situated well toward the pylorus. Hematemesis alone may occur with an ulcer located in any position.

Ninety-three per cent of the cases showed abdominal tenderness, the maximum area being usually at the right of the midline. The points of abdominal tenderness are of certain practical value toward locating gastric ulcers. It should be remembered, however, that similar areas of epigastric distress may be demonstrated in pylorospasm, in diseases due to the gall-bladder, duodenum, or appendix. Sixty-seven per cent showed some evidence of retained contents when the stomach was emptied after a twelve-hour interval. In 32 per cent the motility was not interfered with. Only the persistent demonstration of food retained in the stomach longer than ten hours has definite significance toward the proof that the gastric lumen is not patent. Retention of food for from four- to eight-hour periods is readily demonstrated, intermittently, where pyloric or gastrospasm exists with hyperacidity associated with vagotonia of gall-bladder disease, duodenal irritation, or appendicitis. The persistent finding of test-food remnants after a twelve-hour interval is an indication for surgical intervention. Dilatation of the stomach generally coexists in such cases, but is a secondary, compensatory change.

The highest gastric acidities were uniformly present in acute and subacute perforating ulcers. In simple acute gastric ulcer the figures closely resemble those returned from cases of ulcus carcinomatosum and of chronic gastritis. In chronic ulcer of benign type with retention there is an increase both of free acid and total acid. This is in sharp contrast to instances of retention incident to a developing malignant ulcer; as stenosis occurs free hydrochloric acid is progressively lowered, while total acidity correspondingly increases.

Blood either obvious or occult was found in 39 per cent of gastric extracts. Frequently such blood came from tube manipulation and had no apparent relation to the activity or quiescence of the peptic ulcer. Very often patients were tubed within forty-eight hours following severe hemorrhage without blood being noticed in the removed test meal.

As to the string test, this in 318 cases of gastric ulcer failed in all but seven. In cases in which there is pyloric stenosis the

diagnostic value of the test string is almost *nil*.

About 31 per cent of cases gave positive blood tests in the properly prepared stool. To eliminate error, after catharsis the patient is placed upon a meat-free diet for at least forty-eight hours, and then upon absolute milk diet the twenty-four hours preceding the time for the collection of the stool. Malignant ulcers are likely to break down quickly, and in such cases chemical tests for blood in the stools are positive with fair constancy.

In uncomplicated gastric ulcer the *x*-ray evidences as shown by the plate method are largely accidental. The *x*-ray examination by the fluoroscopic screen gives the greatest amount of information in far shorter time and at less expense to the patient; though the fluoroscope is not infallible.

Many gastric erosions and simple ulcers have a tendency toward healing wholly irrespective of the clinical type of treatment carried on. Also, it is a commonly observed fact that a given ulcer will tend to chronicity and recurrence in spite of all known methods of therapy. There is no means of telling clinically what the ultimate outcome will be. Gastric ulcers of a chronic character not infrequently terminate in malignancy. In a previously published article Smithies has shown that the sex ratio of gastric cancer is approximately that of chronic gastric ulcer; that the average history of the affection before evident malignancy occurred extended over 11.4 years in two out of three cases; that but 1 out of 3 cases of gastric cancer had no previous dyspeptic history; that bleeding occurred in nearly 63 per cent of those with previous ulcer history, and that of the whole number bleeding, 52 per cent had bled two years prior to their coming under observation; that of those who bled within the two-year period, 77.5 per cent fell into that group with ulcer history previous to a period of evident malignancy; that in but 55.4 per cent was free HCl absent in the gastric extract, and that in 31.5 per cent it ranged between 20 and 50.

While the above facts are not to be taken as an indication that the majority of chronic gastric ulcers become malignant, they certainly emphasize the fact that the accuracy of our prognosis of the future course of any chronic ulcer is highly limited and frequently impossible. While malignancy supervenes often enough wholly irrespective of our methods of treatment, it is rational to state that therapeutic measures, which keep the stomach clean bacteriologically and which tend to minimize sources of tissue irritation, should be thoroughly carried on so long as surgical complications have not occurred, or a continuous and progressively downward affection has not succeeded one which was before periodic and without symptoms of malignant intoxication. When in doubt as to the actual pathology existing in a given case, patients should be urged to submit to laparotomy. For it should be remembered that the cases of gastric cancer early diagnosed and surgically curable are those in which the clinical symptomatology is that which we associate with chronic gastric ulcer.

In another article (*Journal of the American Medical Association*, Feb. 20, 1915) Smithies analyzes some 712 cases operatively and pathologically proved to be gastric cancer. Most of the patients range between the fifth and eighth decades. The blood relationship history of cancer was proven in more than 9 per cent of the cases. Smithies observes that we have clinically at least three types of happenings leading up to the diagnosis of cancer. These are given in their order of relative incidence. The first type gives a symptom-complex of two very different stages: (*a*) of gastric disturbance, non-malignant and generally chronic, and may be of gastric malfunction; (*b*) the symptom-complex of a distinctly malignant and pernicious nature. (2) A type rapidly and fatally malignant from the first. (3) A group of cases in which there is usually evidence of years of gastric disturbance of irregular form, clinically, on which is superimposed a type of affection easily recognized as malignant.

As to the ulcer group, which furnishes 61 per cent of the cases studied, the aver-

age duration of all symptoms of the first stage was upward of eleven years. The average duration of all symptoms of the second period was nearly six months. The long probationary period was characterized by a series of attacks of indigestion, usually associated with attacks of epigastric distress or pain, with some relief on taking food. Other pain relief was afforded by alkalies, vomiting, and diet. In 54 per cent of instances the pain was referred to some part of the back. There was usually a good appetite, restrained by the fear of bringing on attacks. About half the cases were constipated and more than half vomited during attacks; this vomiting came on during the acme of the pain. The second stage was characterized by more or less continuous gastric distress, food aggravation, night distress, delayed vomiting, continuous presence of occult blood in the stools, anemia, cachexia, weight loss steadily maintained, weakness, and that peculiar hopeless apathy exhibited by the facies. There was vague distress and heavy feeling of soreness in the epigastrium, and in about one-fifth the cases severe pain. In the progress of the case vomiting becomes more frequently recurrent and profuse, the odor changes from distinctly sour or yeasty to cheesy or rancid. Since 96 per cent of the cases were medullary in type, oozing was common, imparting a tan or deep-red color to the vomitus. A little more than 17 per cent showed vomitus of the classical coffee-ground color.

Over 31 per cent of the cases were clinically malignant from the inception of gastric malfunction, without previous history of indigestion. The longest history in this group extended over 3¼ years, the shortest barely three weeks. Many of these so-called primary cancers exhibit histories extending only over weeks of time, and the symptom-complex closely approximates that which may be regarded as a typical form. The clinical picture, however, exhibits the symptoms of a malignant systemic poisoning. The process is associated with progressive weakness, anemia, weight loss and cachexia, and vomiting changing rapidly to the rancid kind. The gastric pain may be severe and prostrating at first, but later moderates in severity, and is not relieved but is aggravated by food, and is ultimately continuous. In many of these primary gastric cancers the clinical gamut of "gastritis," "ulcer," and "cancer" may be run in a few months or even weeks. Vomiting was observed in 79 per cent of this class. In 64 per cent of those vomiting it was a daily occurrence. In more than 80 per cent "delayed" vomiting was exhibited.

There is a type of fulminant cancer in which the whole history up to the time of laparotomy covered less than seven weeks. It is characterized by profound cancer intoxication from the time of the first departure from gastric health. There was often anemia and marked leucocytosis. At operation the process was always inoperable and perigastric lymph-gland invasion extensive.

Smithies' last group, making up over 5 per cent of his cases, includes those of gastric malignancy, following long history of clinically atypical dyspepsia or dyspepsia of extragastric origin. The clinical manifestations preceding those evidently malignant extended over an average period of 9.4 years. The period covered by the supervening malignant stage averaged 5.9 months. The clinical symptomatology of the affections when they were of a benign nature usually pointed to the gall-bladder or pancreas.

It seems fairly clear that in the great majority of cases the diagnosis of gastric ulcer of a chronic type may be formulated. As to whether this ulcer will heal permanently under treatment, or persist and recur and undergo malignant degeneration, either in the absence of treatment or in spite of that most wisely directed, we have no means of knowing. When the diagnosis as to carcinoma can be surely formulated the operative period is usually past. Therefore it seems wise to excise gastric ulcers before they have undergone malignant change, but not until it has been demonstrated that they cannot be cured by dietetic and hygienic means. The demonstration of this fact will

depend upon a recurrence of attacks in spite of the adoption of habits of life and of diet directed toward their prevention.

CANCER RESEARCH.

In spite of the intensive study of the cancer problem, both from the laboratory and clinical side, it unfortunately remains true that there is no recent progress in the prevention of the disease, nor its radical cure. All study seems to accentuate the fact that the one hope of radically curing a cancer is in recognizing its presence in what has been called the precancerous stage and in radically removing it at that time, though in the treatment of certain forms of skin carcinoma, particularly those of the basal cell type, in the early stages, *x*-ray and radium have both been highly serviceable.

In this relation the Second Annual Report of the Cancer Commission of Harvard University is of great interest. In this report are included brief statements of the work of the laboratory of pathology, and that of genetics and of biophysics. In connection with these laboratories there is a hospital devoted to the study and treatment of tumor cases. In recent times both the hospital and the laboratory staff have been engaged in the investigation of the biological effects, and especially of the therapeutic value of radiations derived from radium, which is regarded as of considerable service, indeed as efficient, in certain superficial tumors and conditions of the skin which, if neglected, are liable to develop into cancer, and especially in myelogenous and lymphatic leukemia, and moreover certain uterine tumors, even though of a malignant type.

In the entire animal kingdom there has been found but one species in which tumors rise presumably from a virus. Certain tumors of the domestic fowl have been found by Rous in his investigations at the Rockefeller Institute to be produced by agents which are so small that they pass readily through the porcelain filter which holds back ordinary bacteria. In no instance has a similar infectious agent been demonstrated in the tumors of mammals, nor is there at the present time any ground for believing that there is a specific infection associated with human tumors.

As to the Laboratory of Genetics, experimentally it has been proven that there is a greater liability to the development of tumor in those whose parents have suffered from tumor than in the offspring of parents who never developed tumors. Animals which are immune to certain transplanted tumors are not immune to spontaneous tumors. By cross-breeding non-related varieties of mice it has been found possible to obtain first a generation which is wholly susceptible to the transplanted tumor, and subsequent generations which are quite non-susceptible. This in itself furnishes one of the strongest proofs of the non-infectiousness of such tumors.

It is stated that the past year has been taken up with preliminary work such as the production of stocks of mice of carefully controlled ancestry.

The Pathological Laboratory reports with satisfaction the possession of a carcinoma derived from a Japanese waltzing mouse which has been propagated continuously for eight years, and a sarcoma originating in a mouse of the same variety which has been successfully transplanted for somewhat over a year. Both these tumors grow in 100 per cent of the mice inoculated and present all the characters of malignant tumors.

The report of the physician in charge is to the effect that somewhat over 200 cases have been treated at the Huntington Memorial Hospital. Most of the cases were of inoperable or recurrent cancer. Radium was refused in cases in which operation was possible and offered the hope of cure, with the exception of the superficial skin lesions.

Up to the present time it has been shown that the best and apparently curative results from radium therapy were obtained in certain types of skin cancer, and other localized forms of cancer. In myelogenous and lymphatic leukemia under radium treatment the blood picture becomes almost normal, the spleen is reduced remarkably in size, and certain symptoms may be relieved with-

out toxemia resulting. In many cases of true cancer which have advanced beyond the operable stage or in those recurring after operation, improvement under radium therapy may follow not only subjectively, but in the local condition. This improvement may include relief from discharge, hemorrhage, and pain, cleansing or healing of ulcerations, diminution in size or disappearance of the local growth. Such cases, however, are rarely cured. Large growths sometimes disappear under the influence of radium, but metastasis, or spreading of the growth to other parts, is not prevented, and, indeed, the patient may succumb to toxemia resulting from the disintegration of the tumor.

Newer methods may improve the results of radium therapy. At present its proved value is certainly limited, but occasionally cases beyond these indicated limits are distinctly benefited.

There follows some tabulations not in themselves of great service, from which it seems there were during the year 218 out-patients and 64 in-patients, from which it appears there were 219 carcinomatous patients and 13 sarcomatous.

Duane in reporting for the Bio-Physical Laboratory has in true scientific fashion little to say concerning the results of his treatment, but describes in detail certain forms of apparatus by which the radium emanations may readily be given.

It must be confessed that a perusal of this brochure is far from encouraging as to the speedy solution of the cancer problem. Filled with cheering optimism, there is nothing in the pages which indicate in the research a definite policy to be pursued or even distinctly suggest that the desired end is in sight. It is worthy of note that disbursements for the year were very near $60,000; that the income derived from the board and care of ward and private-room cases from out-patients, from radium treatment with *x*-ray, from pathological and clinical examinations, from nurses, ward teaching, and miscellaneous was about $4500. The expenses were met by $11,046.99 interest on funds controlled by the treasurer of Harvard College, gifts $47,734.26, and annual subscriptions $4485. Even at the time of writing there goes from the Board a statement of a deficit and an appeal for help.

REPORTS ON THERAPEUTIC PROGRESS.

ON THE CONTROL OF SALVARSAN THERAPY BY THE RAPIDITY OF ARSENIC EXCRETION.

ADLER in the *Boston Medical and Surgical Journal* of December 10, 1914, says that basing his therapy upon his findings, he determines in cases presented for treatment what the interval is between injection of salvarsan and the disappearance of arsenic from the blood, and repeats the dose of salvarsan at the end of the shortest interval thus determined.

If the blood is arsenic-free twenty-four to forty-eight hours after the injection of salvarsan, he has found it convenient to repeat the injection of salvarsan at intervals of three days. In the occasional case in which the arsenic disappears at a slower rate from the blood, this interval must be increased. He has found that salvarsan therapy thus controlled is borne well by the patient, and they have so far not obtained any of the unpleasant symptoms of salvarsan in diseases of the nervous system.

The cases which show the untoward symptoms after inhibition of salvarsan (such as the Herxheimer skin reaction, temperature rise, fainting, epileptic convulsions) are precisely the cases which show a delay in the excretion of the arsenic.

The major portion of the arsenic is excreted the first few hours after injection, and apparently the size of the dose has no effect upon the period of excretion. Increased tolerance to salvarsan seems to run parallel to increased rapidity of excretion.

He adds a table showing examinations of cerebrospinal fluid for arsenic at varying intervals after injection of salvarsan intravenously. It is interesting to note that each examination resulted negatively. The significance of this cannot be discussed here beyond the statement that it corroborates Ehrlich's findings and is in accord with his statement to the effect that the subarachnoid space cannot be reached by injection of salvarsan into the blood stream.

THE SIGNIFICANCE OF THE VON PIRQUET TEST.

In the *Medical Record* of January 9, 1915, FRAZER reaches these conclusions as to the von Pirquet test in reaction:

(1) A positive cutaneous reaction is less frequent in children than it was once thought to be, the high percentage of reaction obtained being due to the application of the test chiefly to the infected children of the poorer classes, and (2) that therefore a positive reaction is of greater significance than it is commonly supposed to be. (3) That while there is an increasing percentage of reaction with years, and a corresponding decrease in the value of reaction, the view usually held that the reaction has significance only during the first two or three years of life is not borne out by recent figures, and that we should be suspicious of a reaction occurring up to the age of ten. (4) That annual tests be instituted in the effort to detect early infection, and that, bearing in mind the fact that many if not most cases of clinical tuberculosis in later years are due to renewed activity of old foci, we should seek by proper means to prevent the development of "infection" into "disease." (5) That a negative reaction, negative on repetition of the test, is valuable evidence of the absence of tuberculosis unless the child be suffering with advanced or acute disease, especially measles. (6) That further study of the test is necessary before we can fully interpret the reactions, and that, in the future, it is possible that refinements of technique may enable us to determine with greater accuracy the recency of the infection.

DIET IN EPILEPSY.

POWERS in the *Interstate Medical Journal* for December, 1914, tells us that to instruct the patient what to eat is not sufficient. He must be told how to eat. It is necessary to be repetitious. We must be repetitious in instructing the patient because we are attempting to correct a habit which has usually been formed in early childhood. With patience and perseverance the mandate to eat slowly and chew thoroughly must be repeated many times until the patient comes to realize that it is an important matter. The teeth must be repaired and replaced when necessary, because the outcome of the case may depend upon it. Once a woman, whom the writer had treated for four months with little success, confessed that she always removed her artificial teeth, a whole upper set, before eating. A great many people regard the teeth from a purely esthetic point of view. Of almost equal importance is the injunction not to hurry or exercise violently after eating. For the school-boy there must be no ball game during the noon hour, unless it be before luncheon. For the child there must be no frolic with the father between supper and bedtime. An epileptic has recently volunteered the information that in an institution where he has been treated the time allowed for eating is limited, the patients being urged by the attendants to eat faster, and he and others have often suffered a series of attacks after one of these hasty meals.

In the diet list which follows, the restriction of milk is to be noted. In his fine work upon epilepsy, Spratling says "milk is the ideal food," and Binswanger in the last edition of his book advocates the milk and vegetable diet. An observer in Germany, however, is at some disadvantage, because in a country where so many are gross feeders any restrictions whatever in diet will benefit the majority of patients. Recent work upon the chemistry of epilepsy by Kozlowski in Poland seems to add to the evidence that milk is less harmful than other foods, but one must view the matter not in the light of chemistry alone. The

preponderance of opinion is certainly in favor of milk as a chief article of diet in epilepsy, and most of the authorities consider it entirely harmless, but a number of experiences, two of which the writer will relate, have convinced him that caution should be observed in permitting it.

A little girl of four was having numerous petit mal attacks. After some months of treatment she had improved very little, and the writer could discover no error in her diet. One day while in the hospital she had five attacks, and on being questioned again about her diet, the mother said that it consisted chiefly of milk, a quart a day. The milk was eliminated, and buttermilk and a varied list more liberal in proteid prescribed. During the following eight days she had three petit mal attacks and then for two months none at all. No change in the treatment except the elimination of milk had been made. She still has some petit mal attacks, but on the whole has steadily improved. Another little girl of seven, while upon the usual routine treatment with bromides, continued to grow worse. She was on the milk and vegetable diet, drinking a quart of milk daily. Malnutrition was marked. The mother was given a diet list and told to reduce the amount of milk. Two weeks later she reported no day attacks, but usually three or four nocturnal attacks—a very great improvement. The dose of bromide was then increased from 5 to 9 grains three times a day, and two weeks afterward she reported no day attacks and usually one nocturnal attack. Further inquiry then disclosed that she was eating no meat except a little chicken, and that she was eating uncooked peaches and grapes. All milk and all uncooked fruit were then forbidden, and permission was given to eat some meat, provided that she would chew it. She then remained absolutely free from attacks for two months and her general condition became much better. She was then taking sodii bromidi 5 grains and tinctura ferri chloridi 1 drachm three times a day. Unfortunately, while visiting in the country, she lost all that she had gained. Brominism followed a larger dose of sodium bromide. One of the blotches became infected, necessitating long confinement, and she is now worse than at any time before. This case illustrates what may happen to an epileptic child while in the country. A few weeks in a place where there was plenty of pie, doughnuts, fresh bread, biscuit, and milk on the table, and where berry picking was the principal diversion, have probably ruined the prospect of recovery which this child appeared to have. In those cases in which milk has appeared to be harmful, the writer has supposed it to be because of the curdling of the milk in the stomach, and he has permitted it when taken upon a cereal or as bread and milk.

A good diet list in epilepsy is the following:

Permitted.

Toast.
Zwieback.
Milk toast.
Graham crackers.
Oatmeal crackers.
Agar biscuit.
Boston brown bread.
Graham bread.
Cream of wheat.
Wheat germ.
Farina.
Grape nuts.
Rice.
Hominy.
Potato, baked.
Potato, mashed.
Potato, stewed.
Macaroni.
String beans.
Spinach.
Summer squash.
Eggs, soft boiled.
Eggs, dropped.
Butter.
Cream.
Meat, only if chewed thoroughly, as follows:
  Chicken, roasted.
  Chicken, stewed.
  Lamb chops, broiled.
  Beef, roasted.
  Mutton, roasted.
  Beefsteak, broiled.
  Fish, boiled.
  Bacon.
  Buttermilk.
  Cooked fruit.
  Milk, not to be taken alone, but on cereal or as bread and milk.
Very little if any of the following:
  Tea.
  Coffee.
  Cake.
  Candy.
  White bread.

Not Permitted.

Fresh bread.
Fresh biscuit.
Doughnuts.
Pie crust.
Griddle cakes.
Beans.
Cheese.
Salads.
Cabbage.
Pickles.
Cucumbers.
Raw tomatoes.
Fried potatoes.
Cold potatoes.
Melons.
Berries.
Grapes.
Uncooked fruit, except oranges, figs, and dates.
Pepper, mustard and other condiments.

Note.—Eat regular meals. Eat slowly and chew thoroughly. Never eat too much. Never hurry after eating. Drink plenty of water. Drink a tumblerful of water at bedtime. Never eat for pleasure.

Saline cathartics are much abused in epilepsy. With diet, specific exercises for the abdominal muscles and abdominal massage, the milder laxatives such as cascara sagrada are sufficient. To prescribe

the salines in any but acute conditions is to abuse them. They cause overdistention of the colon and cecum with possible impairment of the ileocecal valve. Enfeeblement of peristalsis invariably follows this repeated stretching of the intestinal walls, and perhaps the secreting cells of the mucosa are injured by the excessive withdrawal of fluid from them. Distinction should be made between the salines which act by abstracting water from the tissues and the bitter drugs like cascara which do stimulate secretion. The former are habit-forming, while the latter are often curative because by stimulating cell activity they stimulate cell growth. The sinusoidal electrical current applied to the colon works well in some cases of epilepsy, but appears to induce seizures in others. The production of antiperistalsis with regurgitation into the ileum may account for its ill effect in these cases.

INSOMNIA AND INDIGESTION.

The *Universal Medical Record* of London for November, 1914, states that in a thesis read for the Dublin M.D., KELLY draws attention to the cases of insomnia caused by dyspepsia. Apart from pain and organic disease he looks upon worry and overwork as the most common cause of sleeplessness, owing to the accumulation of waste products in the system. Neurasthenia, of which sleeplessness is one of the most trying symptoms, is grafted upon worry and overwork. Chronic sleeplessness from the wear and tear of every-day life in the main is due to digestive disturbance. Whether this digestive disorder is to be looked upon as cause or effect, it is difficult to say, but it seems almost inevitable that metabolism must be influenced by any condition which so upsets the general economy as to encroach upon the resting-time requisite for the recuperation of spent energies, and in most cases a vicious circle becomes established whereby digestive faults are accentuated by insomnia, to which in their turn they contribute materially.

The one type, which may conveniently be called the asthenic type, of indigestion is dependent upon a want of power in the stomach as regards both secretion and contractility, and is met with in people—mostly women—who are badly nourished, pale, thin, and run down. They complain of loss of appetite, flatulent distention and stomach discomfort immediately after taking food, eructations that are sometimes sour and often offensive, a fear of food because of its effect in increasing discomfort, and a desire to relieve the situation by vomiting. These patients are always troubled by persistent insomnia, or at best short and unrefreshing sleep. It is not uncommon in these cases to find a displacement of the right kidney, accompanied in some instances by a sagging of all the abdominal contents, which causes the patient to experience a wearying sense of bearing down.

These cases can be cured by stimulating the gastric functions mainly by the use of non-fluid diet and by giving before each meal a simple bitter alkaline mixture such as

℞ Sodii bicarb., gr. xx;
Tinct. nucis vom., m. x;
Tinct. zingiberis, m. xx;
Inf. gentianæ co., q. s. ad f℥j.

The other or sthenic type, more common in men than in women, presents a striking contrast to that just now described. The patient is often well-nourished and plethoric. He complains of pain three or four hours after food, which is relieved by an alkali such as bicarbonate of sodium. He has a good appetite and is seldom sick. He is often disturbed about 3 A.M. by "hunger pain." His bowels are confined, and he is depressed about himself and curiously introspective. His stomach is dilated and frequently reaches below the umbilicus. There is an excess of hydrochloric and also of organic acids. The clinical picture suggests duodenal ulcer, but there is neither hematemesis nor melena, and the symptoms disappear with appropriate treatment.

The treatment must be essentially sedative. The hyperacidity is the chief disturb-

ing factor. Milk should be the main food for three days, tea should be avoided, red meat used sparingly, sugar and starches left out altogether. Each meal should be preceded by a sedative mixture such as

℞ Tinct. belladonnæ,
Tinct. opii, āā m. x;
Liq. adrenalin, m. x;
Spt. menth. pip., q. s. ad f℥j.

To be taken in two tablespoonfuls of water a quarter of an hour before meals.

Many devices have been suggested as a means of procuring sleep for those who, apparently healthy and free from strain of any kind, are yet unable to command it. Monotony is a well-known sedative; the enumeration of figures, the falling of rain, the droning voice of an uninteresting and prosy reader are familiar examples.

In mild cases of insomnia, change of scene, a sea voyage, moderate exercise in the open air, temporary withdrawal from the ordinary activities of life, are each and all not to be neglected.

Massage, especially when practiced thoroughly and rapidly over the abdomen, a hot bath, a mustard foot-bath, a wet pack applied to the body, all act by producing anemia of the brain, and so bring about a refreshing sleep.

When all these measures fail, recourse to drugs of the narcotic and hypnotic class becomes a necessity. The most certain is morphine, though its use is not to be advocated.

When sleep is prevented by neuralgic or muscular pain, aspirin, phenazone, acetanilide, exalgin, phenacetine, by relieving pain assist in inducing sleep.

Of all the hypnotics the bromides are the least harmful, and a full dose of one or other of the salts is sometimes sufficient to procure sleep.

Next to the bromides, chloral hydrate is the most valuable hypnotic. It should not be given in cardiac cases.

Hyoscine is one of the most powerful hypnotics, and is said never to induce a habit, but owing to its toxicity care must be observed in its administration.

Of the vast army of recent hypnotics no mention need be made. The demand for them obviously exists, else the supply would not be forthcoming in such luxuriant abundance, and the inference would seem to be either that humanity is more sleepless than it used to be, or that it is less tolerant of occasional disturbance of its night's rest.

INDUCED PNEUMOTHORAX.

In the *Interstate Medical Journal* for December, 1914, SCHWATT says that these are the absolute indications:

1. Moderately and far-advanced, severe disease of one lung with slight or moderate disease of the other side, which does not extend over more than one-third of the lung, and without active cavities. In such cases the compression should be effected slowly and the uncollapsed side be carefully watched for increased activity.

2. Moderately and far-advanced disease of one side of slight or moderate severity with disease on the other side, as described under 1, especially in cases in which a fair trial has been given to the usual modes of treatment.

3. Severe and particularly long-continued hemoptysis, irrespective of disease on the other side, provided it can be definitely determined where the bleeding comes from. In cases in which there is no contraindication in the extent of the disease of the other lung, the compression should be kept up. In cases with too extensive disease of the other lung, the lung should be permitted to reëxpand after sufficient collapse has been produced to control the hemoptysis.

Schwatt names the permissible indications as follows:

1. Severe and extensive disease of one side, with disease on the other side more extensive than described under "absolute indications," in cases with general symptoms of toxemia which may be definitely ascribed to one lung.

2. Initial cases, particularly those with severe symptoms not showing signs of improvement or arrest under hygienic-dietetic and specific treatment after a reasonable length of time—not exceeding six months.

3. In all classes of cases under "absolute indications" with laryngeal tuberculosis of slight or moderate severity and non-ulcerative.

The dangers and complications of pneumothorax therapy should not be considered as contraindications to the application of the treatment.

THE PRESENT STATUS OF THE TREATMENT OF ADVANCED CARDIAC DECOMPENSATION.

Writing in the *Interstate Medical Journal* for December, 1914, TAUSSIG gives this advice:

Rest.—No method of treating a seriously impaired circulation can succeed unless the patient has sufficient rest. This does not mean merely keeping him in bed, indispensable as this is. He must be protected from all worry and excitement, and above all he must have a sufficient amount of sleep. These patients are, moreover, nearly always poor sleepers, even when they are not kept awake by definite discomfort, so that sleep must usually be induced artificially. The milder hydrotherapeutic measures, such as the partial or complete wet pack, rarely suffice, so that usually one must have recourse to drugs. Veronal, in 5- to 10-grain doses, or adalin, 15 to 20 grains, often produce refreshing sleep, and paraldehyde, in doses up to half an ounce, is sometimes successful when all other soporifics fail; but not infrequently nothing will avail but morphine, which, when necessary, must be given freely. A sufficient amount to produce sleep, varying from 1/12 to ¼ grain, rarely as much as ½ grain, may be given hypodermically at bedtime. A single adequate dose will usually act more satisfactorily than two smaller doses, even when the latter in the aggregate amount to more.

Another method of giving morphine in these cases, which the writer learnt from the late Dr. W. E. Fischel, and which, both in his hands and in the writer's, has been productive of most satisfactory results, consists in the administration by mouth of minimal doses at short intervals. Thus 1/24 grain may be given every three hours, either with or without digitalis, producing not only a sensation of well-being during the day but also quiet sleep at night. Occasionally, in patients with a violent idiosyncrasy against digitalis, morphine alone thus given will act as a most efficient heart tonic.

Diet.—Mental and physical rest is not, however, the only kind of rest required; the digestive tract must be taxed as little as possible. This is, of course, a commonplace, and no one, probably, attempts to treat grave cardiac decompensation without restricting the diet. This restriction is not, however, always carried out on a rational basis. The three indications in the dietetics of advanced decompensation are an easily digestible food and a rigid restriction both of the salt and the water intake. These indications are met in an almost ideal fashion by the modified Karell regimen. Karell was a Russian physician who, in 1866, advocated an exclusive diet of skimmed milk, from 60 to 200 Cc. three to four times daily; nothing else. During the second and following weeks larger quantities of skimmed milk (up to 1500 Cc. daily) were allowed, and this dietary persisted in for some time. The suggestion did not, however, attract much attention until it was revived in 1908 by Jacob in Lenhartz's clinic. Since then, in a more or less modified form, it has met with increasing favor, particularly in advanced cardiac impairment and especially in the presence of extensive edema or hydrops. A useful modification is the following: The patient receives from 800 to 1000 Cc. of milk daily, in small amounts at rather frequent intervals. For five days he takes nothing else, not even water. The patients usually do not complain of hunger, but often of thirst. If the latter is excessive, a little fruit juice may be given, or better still small amounts of morphine every few hours, a medication which is particularly useful and grateful at this time. After five days the diet is somewhat relaxed, and for two days the patient receives, in addition to a somewhat large amount of milk, toast or cracker with

unsalted butter and rice prepared with a minimum of salt. Then five more days of milk diet, like the first, follow, whereupon the half-starved patient is fed more liberally.

The results of this regimen are often astonishingly good. The patient soon feels more comfortable and much less dyspneic. The subjective improvement usually comes earlier than the objective, but before the close of the first milk period the latter, too, in suitable cases, is evident. The first change for the better is in the quality of the pulse, which improves earlier than its rate or rhythm. These often yield only to the subsequent administration of digitalis, but, and this is one of the great advantages of the regimen, the latter is then effective more rapidly and in smaller doses than before. Indeed, it is in just those cases in which digitalis has proved ineffectual that the Karell cure is most definitely indicated. The heart, which before treatment proved refractory to digitalis, may after it respond satisfactorily to the drug. The blood-pressure usually shows no change, but occasionally, especially in cases of marked hypertension with little or no evidence of renal disease, the fall in pressure may be considerable and to a certain extent permanent. If the kidneys are seriously involved, and especially if uremia is impending, the Karell regimen is contraindicated. So radical a restriction of the intake of fluids is then not advisable; the drinking of considerable amounts of water should rather be encouraged. In purely cardiac cases the diuresis, and with it the salt output, usually increases, sometimes greatly, and reaches its maximum about the fourth or fifth day. If no diuresis sets in, the treatment is usually ineffectual in other ways also. Diuretics may then be given, but the prognosis in such cases is usually bad. The albuminuria, if present, usually diminishes or disappears, during the course of treatment, provided it was due to passive congestion. If it persists, the presence of organic renal disease may be inferred.

One of the most striking effects of the diet is the behavior of the edema. The latter often disappears rapidly, and even considerable effusions into the serous cavities may be absorbed. Of course, not all cases respond equally well. Leaving out of consideration those patients whose myocardium is too profoundly degenerated to respond to any treatment, the results of the diet will be the better the more purely the disease is cardiac. Cases of pure myocardial degeneration do best with those in whom the cardiac weakness follows a valvular lesion a close second. Cases of hypertension do not respond so well, though here, too, good results may sometimes be achieved, while nephritics are usually not benefited. Occasionally, as Wittich has pointed out, the diet will prove advantageous even though no improvement can be observed during the two weeks it is carried out. The response to treatment after the Karell cure may be so marked in comparison with the patient's previous failure to respond that some portion of the credit must be assigned to the diet. Often, perhaps usually, it is advantageous to give digitalis, strophanthin, or diuretics during the course of the diet, and it then becomes difficult to determine how much of the patient's improvement should be ascribed to the latter. The pure Karell regimen will be most frequently indicated when the patient's digestion has been badly upset by digitalis, or when, for some other reason, it seems desirable temporarily to discontinue the drug.

DECAPSULATION OF THE KIDNEY.

In the *New York Medical Journal* of January 9, 1915, HUGGINS reviews this topic. He thinks that decapsulation and nephrotomy are entitled to a place in the treatment of nephritis. The success and value of the operation will depend entirely upon the care and judgment with which cases are selected, being mindful at all times that the immediate mortality must be high, and the use of the scalpel occupies the same position as do diuretics or hot baths; it is not curative, but is a measure indicated in the emergency with a hopeful prospect of prolonged life. It is not to be used until

all other methods have failed, and when employed it must not be done indiscriminately. Its use seems to be indicated:

1. In toxic nephritis following acute poisoning by mercury or carbolic acid.

2. In nephritis following infection, especially the acute infectious diseases, such as scarlet fever, etc., where there is great edema, or in the presence of uremia; its use should be considered as soon as medical measures have been thoroughly tried without relief. This is true especially in young adults and children.

3. In severe hemorrhage complicating chronic nephritis, when the bleeding is practically limited to one side. In these cases a nephrotomy should be done to make sure of the exact cause of the hemorrhage.

4. It may be indicated for the relief of renal pain which sometimes occurs in the course of chronic nephritis.

5. It may be of value in uremia and anuria during the course of chronic nephritis, merely as an emergency measure.

6. In eclampsia, when the symptoms are due to faulty action of the kidney, and where improvement does not follow delivery of child.

7. Cases of movable kidney associated with albuminuric casts and hematuria, in which the urinary signs result from the trauma incident to the mobility, may be cured by decapsulation and fixation, but when coincident with chronic Bright's only temporary good is effected.

SHOULD A NEW-BORN INFANT RECEIVE ANYTHING DURING THE FIRST TWO OR THREE DAYS?

HERRMAN, in the *New York Medical Journal* of January 9, 1915, opposes the view that new-born babies that receive nothing show no signs of injury. To a certain extent the writer thinks this may be compared to feeding in typhoid fever. Even with the method of partial starvation a large percentage of patients recover, but all who have employed the method of more liberal feeding will agree that the patients have complications no more frequently, are better able to resist complications when they do occur, and are in a better condition at the termination of the disease because they have lost less weight. The average infant can stand an initial loss of ten or twelve ounces without any apparent disadvantage. The same cannot be said of premature or congenitally weak infants. This is pretty generally acknowledged, so that in the latter early feeding is advised. But if an abnormal infant can stand it, why not a stronger one? It ought to be advantageous to reduce the initial loss; in some cases the loss of a few additional ounces might be enough to turn the scale. If the practitioner gets the impression that the giving of anything during the first forty-eight hours is injurious or unnecessary, he may hesitate to give those who really need it. Water certainly is necessary. It is usually advised to give a teaspoonful now and then. The result is that in a maternity ward it often happens that the new-born infants get none, or at most an ounce or two a day. Any one who has observed new-born infants carefully must have noticed that on the third day after they have lost ten or twelve ounces the tissues show a distinct loss of tone. This cannot be entirely harmless even if in most cases the injury is not strikingly apparent.

During the last five months the writer has employed the following method in 200 new-born children: Six hours after delivery the baby is put to the breast, and thereafter regularly every three hours during the day. It remains at the breast for five minutes, and is then given one and a half ounces of a ten-per-cent solution of lactose after each breast feeding. This is usually continued for the first forty-eight hours. If the mother has an insufficient quantity of breast milk, and no other mother in the ward is available for breast feeding, the supplemental feeding with a solution of lactose is continued for one or two days longer. It has been found that a new-born child needs from twenty to twenty-five calories to each pound of weight per diem during the first few days to meet the energy requirement, so that the average new-born baby would need about 150 calories a day.

The foregoing method just about supplies that amount. The result has been:

1. A reduction in the average initial loss from eleven to six ounces.

2. An increase in the percentage of cases regaining their birth weight after ten days, from thirty-five to sixty-five per cent.

3. No inanition fever since the introduction of this method.

4. The infants have been followed through the first month and have retained their advantage, compared with control cases in which the old method was employed.

5. The writer has seen no disturbances that could be attributed to this method.

PITUITARY EXTRACT IN POSTOPERATIVE INTESTINAL STASIS.

In the *New York Medical Journal* of January 9, 1915, DUFFY reaches these conclusions:

1. Pituitary extract is an important aid in postoperative paralytic ileus.

2. It should be tried in all cases in which purgatives are not retained by mouth.

3. Its effect on the peristalsis in cases with tympanites seems to be more marked than in cases with no intestinal distention.

THE USE OF PITUITARY EXTRACT IN OBSTETRIC PRACTICE.

The *Medical Record* of January 9, 1915, contains an article by BANDLER on this topic. He discusses the use of pituitary extract in obstetrics, not with an array of statistics nor with a detailed report of individual cases, but simply hoping to convey the very favorable impression that has been made upon him after an extended use of this drug in the various types of cases as they occur in obstetrical practice over a period of years.

His experience with the technique of many physicians and his observations in the cases of colleagues with whom he has been associated in the conduct of such cases have shown him that the sterling value of pituitary extract is not generally recognized. The use of this preparation seems to be looked upon as indicated by special or urgent considerations only. The purpose of these observations is then to call attention to the value of this drug, not alone in cases in which no progress is made or in cases in which urgent haste is demanded, but in the conduct of the average case as it comes through the hands of the practitioner in his routine work.

No addition to our obstetric aids has been of such potent service as has the use of pituitrin. It has simplified many questions, has shortened the duration of labor in primiparæ, and most particularly in multiparæ, and has removed almost entirely the necessity of applying low forceps, except in the very rare case of emergency. (As to high forceps, indications are complex, opinions differ, and version and Cæsarian section come into consideration.)

Pituitary extract does not act to the same degree in all patients; a small dose in one case is very effective, whereas numerous repeated doses are necessary in other cases. It increases the pain which the patient feels, but, and this is the purpose for which it is used, it increases the efficacy of the uterine contractions.

In selecting cases for its use and choosing the proper time, one must be guided, not by the subjective sensation of pain which the patient has experienced, nor by the frequency of the pains alone, but by the progress which is being made. Therefore it may be used in the first stage of labor as well as in the second stage.

Pituitary extract does not act unless labor pains have begun, hence it is of value in determining whether the pains which the individual feels are true labor pains. For instance: Take a case in which the membranes have ruptured before any pains have begun. Periods varying from a few hours to two or three days may elapse before progressive labor begins, yet in the meantime there may occur occasional periods when severe pains follow in fairly rapid succession, only to die out shortly after. An injection of pituitrin given at this time may be of no value whatsoever; or it may add force and continuity to the pains, in which

event successive injections will cause them to progress into the regular steps of a genuine parturition.

Take another instance: A patient had gone two weeks over the expected period, and had had on two occasions, at night, severe attacks of pains, coming on at ten-minute intervals, for an hour to two hours. The patient's husband, a physician, was loath to call the writer because he was uncertain as to whether these pains were real or not. The writer urged the husband to inform him the next time this happened. The husband did so. An injection of pituitary extract was then given, and the patient went on to regular continued pains and was delivered in ten hours.

If regular pains, associated with appreciable dilatation of the cervix, have once begun, the use of pituitrin increases their power and causes extremely rapid dilatation of the cervix. There is no reason why the first stage of labor should be allowed to prolong itself beyond a reasonable number of hours, with a head engaged and molded in the brim. It occurs of itself so quickly in many cases that we may be reassured in our belief that a rapid dilatation is not injurious. For us to let nature direct this process sluggishly and indolently, fortified by the thought that no harm is done to the fetus so long as the membranes are intact, is to add hours of pain and discomfort to the patient.

While the writer was attending one patient in confinement another patient had been in labor with pains occurring every ten minutes, occasionally every five minutes, for over twelve hours. When he reached this patient the cervix had disappeared, and only the edge remained, but dilatation was present only to the extent of one finger. Three minutes after the first injection of pituitrin there was a marked show, and in less than two hours the cervix was completely dilated, after which the membranes were ruptured and labor was completed in one and a half additional hours.

In those cases in which the Barnes bag is used, it is occasionally necessary to introduce a second or even a third bag, because, after the expulsion of the first, labor pains do not occur or recur. If during the action of the Barnes bag an injection of pituitary extract be tried, and perhaps a second injection be given, it not rarely happens that the labor pains go on at once rhythmically and regularly, so that the introduction of the second bag is not needed.

There is no certainty about the action of the preparation in such cases, but it occurs often enough to be worth a trial in all instances, and can be productive of no harm or annoyance.

In the second stage of labor, with the head firmly fixed and molded through the brim of the pelvis, and in those cases in which, in multiparæ, there is no doubt as to proper relationship between the fetal head and the pelvic brim, pituitary extract is used to increase the actual propulsive powers of the uterine muscles, and to hasten the progress of labor. The further down in the pelvis the fetal head, the safer is the indication for the use of pituitrin, if progress be slow.

The term "atony" does not mean that the uterine muscle may not do its work. We select a period, to be sure, when it does not, and call it uterine atony. All of us have been prompted, at times, to give morphine or other drug, let the patient have a restoring sleep, and then await, sometimes with success, sometimes not, the recurrence of forceful pains. In many instances we have applied forceps without delay and so aided delivery. Such a uterine muscle can be made to work successfully if proper stimulation be given it. Hours of annoying pain are saved, and the use of forceps almost entirely obviated. In fact the writer has been using pituitary preparation in more than three-fourths of his cases, and he finds forceps are indicated once where formerly he was compelled to use them four or five times. The use of the drug toward the end of an indolent second stage, plus the careful administration of chloroform, constitutes as advantageous and practical a form of "twilight sleep" as one could possibly wish for.

Recently the writer was asked to come

and apply forceps in a case in which the head had been visible for a long time, but progress had ceased in spite of continued pains. The writer advised the administration of one-half ampoule of pituitrin, and progress became evident almost immediately; shortly after chloroform was administered, and, with the aid of a second half ampoule, delivery was successfully terminated, and a twelve-pound baby was born without the patient being aware that any change had taken place. The writer's observations so far have been confined mainly to primiparæ. It is, however, in multiparæ that pituitrin gives the most astonishing results. Since using this drug the writer has not been compelled to spend more than two hours at the bedside of any multipara in labor.

Once labor pains begin, whether the head is engaged in the brim, or whether, as so often happens, the head is well above the brim, the use of this drug produces astonishing results. Cases in which there is scarcely any dilatation of the cervix and no fixation of the head in the pelvic brim deliver themselves in anywhere from fifteen minutes to two hours. Not that this happens always, but it almost constitutes the rule.

When once a hypodermic of pituitary extract has been given, it is a risky thing to leave the patient's bedside. This naturally holds true to a far, far greater degree in multiparæ, and is decidedly applicable to multiparæ in the second stage.

The method which the writer follows in the application of this remedy is to inject half an ampoule and observe its effect, and thereafter to inject, at intervals of half an hour and up, half an ampoule of pituitrin as often as may be indicated. He judges of progress by the fewest possible examinations. The visibly contracted uterus, the character of the patient's outcry, the sensation of pressure on the rectum, the feeling as if the "bowels want to move," all give him additional information.

The writer can imagine no injurious effects from this procedure, and he believes that the drug has no harmful influence. He has often given six to eight injections at intervals of half an hour, each consisting of half an ampoule. The effect of each of these hypodermics is generally temporary and evanescent.

It may be said, then, that in any case where the position is one that does not demand correction, where there is no malrelation in dimension between the fetal head and the bony pelvis, where the progress of labor is slow or where it is desirable to accelerate it, or where, because of any condition in the mother or in the child haste is necessary, pituitary extract is indicated as a safe and valuable aid in primiparæ or multiparæ, in normal labor or in dry labor.

In the third stage previous hypodermics have a splendid effect, leading to the ready expulsion of the placenta, and causing firm contraction of the uterus. The writer has used ergot at the end of the second stage for years, and continues to use it, no matter how much pituitrin has been injected, as he finds its action prompt, effectual, and extremely reliable.

In the postpartum stages he occasionally uses pituitary extract to aid in the involution of the uterus, but its use should not be continued for too many days, as it might well cause a marked atrophy.

So far as the writer's experience goes, there is no contraindication, of a general nature, to the use of this remedy. It may be used in eclampsia and in those cases in which the kidney is involved. Aside from its application to the stages of labor, it is of value in overcoming the atony of the bladder so frequently present on the first or second day postpartum.

In the various stages of inevitable abortion it is of value. It is especially indicated after curettage for this condition. When repeated daily or every other day, for a long period of time, it aids in contracting the subinvoluted uterus, the fibrotic uterus, or the uterus which bleeds without definitely ascertained pathological cause, but a cause which exists in the uterine wall itself.

The writer uses it in Cæsarian section, the moment the operation is begun. Just as soon as the abdominal incision is made a

hypodermic of pituitary extract is given. Contraction of the uterus is already apparent after incising the uterine wall, as delivery of the fetus through the incision is somewhat difficult. After removing the placenta and membranes the uterus contracts mightily, and the uterine wound seems very small indeed. Bleeding is remarkably slight. He administers it for a week or ten days after a Cæsarian section.

THE TREATMENT OF PNEUMONIA IN CHILDREN.

In the *Boston Medical and Surgical Journal* of January 14, 1915, DANA gives his treatment of 104 consecutive cases of pneumonia in children.

This series of cases was treated by him during three years' service in Roxbury as district physician of the Boston Dispensary. There were 44 cases of lobar pneumonia and 60 cases of bronchopneumonia. Since he has not treated the two conditions as such differently from each other, the figures as to age periods include both types of the disease indiscriminately.

	Number of cases.
Under one year	25
One year	21
Two years	15
Three years	12
Four to five years	14
Five to eight years	12
Eight to twelve years	5

Of the whole number treated, two cases died. One of these, in addition to having pertussis as a complication, had taken almost no food in the week previous to beginning treatment. The other case, a feeble baby six weeks old, was not seen early in the disease. There was recovery in the other 102 cases. Many of these cases had pertussis or measles as complications to the pneumonia, and in many cases treatment was not sought until several days after the onset of the infection.

Home conditions were unfavorable in all of Dana's cases in this series. The patients lived in a poor neighborhood, in tenement houses; often the parents were very ignorant, and many of them were opposed to modern theories of ventilation. The fresh-air cure is difficult to give anyway where a family of from four to eight people live in two or three rooms. There was little to do with, and of course since the nurses of the District Nursing Association could at the utmost make but two daily visits his treatment was based on this amount of nursing. While, naturally, constant nursing care would be more desirable, certainly no nursing could have been more efficient, painstaking and enthusiastic than that which these patients in Roxbury received. In most cases Dana obtained the loyal coöperation of the mother, and he feels certain that the care given by the nurse and by the mothers of the children produced the favorable results obtained.

The routine was as follows:

1. Fresh air constantly. Often, in winter, a child can be kept better covered and warmer if it be bundled fairly tightly into a baby carriage or a clothes basket, when it is to be put near an open window, than if kept in bed.

2. Food. This is extremely important. If one is willing to take the necessary time and trouble, small amounts of liquids, or semisolid food, can be given to a child, and if repeated often considerable nourishment can be given. Often the fact that a sick child does not wish food is regarded by the mother as a sufficient reason for not giving the child any food.

3. Saline enemata. Long, slow, hot normal saline irrigations of the bowels once or twice a day are useful as a means of stimulation, to give water to the body, to reduce toxemia, and also for cleansing purposes. If necessary, calomel in divided doses was used for distention or constipation.

4. Cold applications to the chest. This was accomplished by wringing cloths out of cold water, applying them to the skin, covered over with newspaper to protect the clothes. These applications should be renewed when they become warm.

5. Bathing. These children received a tepid sponge bath, preferably followed by an alcohol rub, twice daily if the temperature reached 102° F.

6. Brandy. When the temperature is

high or long continued Dana is personally in favor of large doses of brandy, perhaps 20 to 50 drops every two hours for a child one to three years old. The brandy is better not given with food as it may make the child vomit, or make the food objectionable to the patient.

7. In one case in which Dana suspected a streptococcus septicemia, as a sequel to pneumonia, antistreptococcus serum was given twice daily, apparently with brilliant results.

8. Drugs. As a routine all of these patients were given ammonium chloride and syrup of ipecac, using the fluid extract of glycyrrhiza as a vehicle. For a child under a year Dana uses a quarter to a half drop of the ipecac each two hours. For all children over a year he gives a drop of ipecac for each year of the child's age each two hours, and a grain of ammonium chloride each two hours for a child from one year to twelve years old.

If the child is very sick, it is given tincture of belladonna, a quarter to a half drop up to eighteen months of age, and one to one and a half drops for older children each two hours.

A method Dana has found convenient for prescribing these drugs is to add together the number of drops or grains of each ingredient desired in one dose, and then to order as many drachms of each to be put into the mixture as there were drops in each dose. For instance, for an eighteen months' old baby, if he wishes to give a grain of ammonium chloride, a drop of belladonna, a drop and a half of ipecac, using five or six drops of the vehicle, he writes for the following mixture:

> Ammonii chloridi, drachm j (gr. j);
> Syrupi ipecacuanhæ, drachm jss (gtt. jss);
> Tincturæ belladonnæ, drachm j (gtt. j);
> Extracti glycerrhizæ fluidi, drachm vss (gtt. vss.)
>
> M. Sig.: Give eight drops in a spoonful of boiled water every two hours.

As sheet-anchors in case of need Dana uses, first, tincture of digitalis, based on a minim and a half dose for each year of age each four hours when the heart action is weak and rapid; finally, as a standby, he makes a solution of strychnine sulphate and gives large doses, one four-hundredth to one one-hundredth of a grain every four hours, stopping this drug after a day or so, or as soon as he can, to hold it in reserve for further need.

INTRAVENOUS INJECTION OF DIPHTHERIA ANTITOXIN IN CHILDREN.

The *American Journal of Diseases of Children* for January, 1915, contains an article on this topic by SCHORER. He says it is not to be inferred that intravenous injections are advocated in all cases, but intravenous injections undoubtedly produce results more rapidly and are to be preferred in late and severe cases.

Intravenous injection is less painful at the time of administration and later, and because of the smaller number of units necessary it is much less expensive. Entrance into the jugular vein in children is not difficult, and this vessel affords a ready site for the intravenous injection of diphtheria antitoxin when the median basilic and the cephalic veins are too small. This small series indicates that there are fewer carriers and heart failures are less likely to occur following intravenous injection, but there are more immediate and serum reactions. The immediate reactions never impressed the writer as being grave, and in themselves did not seem to be a contraindication to intravenous injection of diphtheria antitoxin.

TWILIGHT SLEEP IN OBSTETRICS.

The *American Journal of Obstetrics* for January, 1915, gives its editorial opinion of twilight sleep under the heading of "An Obstetrical Procedure on Trial." It says that no development in obstetrics during recent years has attracted such attention among the members of the medical profession, and the public, as the procedure commonly designated as "twilight sleep," or by its German equivalent, "Dämmerschlaf." The desire to alleviate the pangs of childbirth is a humane and justifiable one.

Whether to accomplish this by a better preparation of the mother for her supreme function in life, or by means directed to the immediate alleviation of the difficulty during labor, is still an undecided question. To the impartial observer it must be apparent that the average woman of the present generation, in what may be called the better walks of life, has less difficulty in most instances in delivering herself in a normal manner than was the case during the period of our mothers and grandmothers. This has undoubtedly been brought about by better hygienic conditions for our growing girls, including proper exercise and outdoor life. A great many women, however, suffer considerably during the process, but, strange to say, the suffering in an ordinary, otherwise uncomplicated case of labor is of such a character that it apparently leaves very little lasting impression on the mind of a normal woman. It may be safely stated as a matter of fact that at the present time most women do not regard with dread their oncoming confinement. Stories of difficult labors, like other disagreeable experiences, are very apt to be talked over among a limited circle of women, and being duly exaggerated in the telling, such isolated cases are accepted as standards by women who are of a nervous temperament or of an unstable mental equilibrium.

Although parturition should constitute a perfectly physiological event, many factors both in the individual and her environment have contributed to make the process of pathological significance in many cases. Notwithstanding this, a large proportion of women under skilful care and supervision manage to go through their labor and get up in a reasonable time without injury to their mind or body. The period of preparation for labor, as it involves the organs immediately concerned in this process, is a gradual one, and where the physiological development has proceeded normally in the individual case the final delivery is usually free from burdensome accompaniments. An active labor consists of both involuntary and voluntary phenomena, each of which is active in its proper time and sphere and one set is dependent upon the other. During the so-called first stage of labor the process may be summed up as one of preparation and propulsion. In order that propulsion may proceed satisfactorily, dilatation of the lower uterine segment and the vaginal canal is essential. This is the result of the involuntary but coördinate action of the uterine muscle. Following this comes the stage in which propulsion is accompanied by expulsion, the result not only of involuntary but likewise of voluntary activity on the part of the mother. Therefore in discussing the value of the proposed procedure, the question resolves itself into what interference with the normal processes of labor results from its application, and whether any real necessity exists for its routine employment. The most enthusiastic advocates of the method of scopolamine-morphine anesthesia admit that although the first stage of labor is favored, or at least not interfered with, by the procedure, the second stage, on the other hand, is very apt to be prolonged. It is during this time that the greatest danger to the child may result. It is claimed that the voluntary expulsive efforts on the part of the mother are not interfered with by this form of narcosis, but that the woman is able to bring into play her accessory muscles of parturition without being aware of the fact. Is this contention borne out by the statistics, which show that the prolongation of the second stage already referred to necessitates in many instances the application of forceps for the purpose of terminating labor?

Admitting all the favorable things which have been said in regard to "twilight sleep," are the results sufficiently convincing to permit of a general adoption of this procedure? Those who have given the method a most careful study are of the unanimous opinion that individualization and the conduct of the case in a hospital are requisite to its proper and successful employment. This at once limits its application. Nevertheless many will attempt it under surroundings which are not favorable, and if

the popular clamor leads to its more extended application by the profession at large, we will soon hear of direful consequences. In American literature a comparatively small series of observations have been reported, and these only within the past few months. In Germany the publications of Krönig and Gauss have referred to a much more extended series of cases. Unfortunately, however, the brilliant results claimed by European observers have apparently not been duplicated in this country by careful students of the procedure. The first flush of success in its employment seems to have been succeeded in the minds of many by a more conservative attitude toward the method, and it is doubtful whether in this country even those who are most enthusiastic will permit their enthusiasm to range as widely as that of our European colleagues.

It is sometimes claimed that the necessity for general narcosis for operative procedures is analogous to this device in labor. Here, however, our main indication for the narcosis, or anesthesia, is not only to avoid pain and shock, but also to shunt out uncontrollable efforts of the voluntary muscles of the body to overcome the operative insult. In labor the status is entirely different. We are dealing with the consummation of the final stage of the act of parturition, for which, under ordinary conditions, there should be no more need for narcosis than would be required for the act of defecation. Admitting, however, that most labors verge on the pathological and may require some degree of narcosis either to alleviate the pain or to favor the period of dilatation, have we not on hand remedies amply tried which will aid us in such cases? Is it necessary to resort to a drug or combination of drugs which have not been satisfactorily subjected to analytic tests and animal experiments, and toward which patients very frequently manifest previously unknown or unsuspected idiosyncrasies? Are the advantages gained from the procedure of "twilight" of sufficient extent and importance to overbalance the disadvantages which even the advocates of the method are compelled to admit? Undoubtedly a large percentage of women thus treated deliver themselves satisfactorily of non-asphyxiated babies, but aside from the amnesia, would not the same individuals have done equally well without a narcosis wrought with some degree of uncertainty and danger? On the other hand, can we disregard the warning sounded that in many women the second stage under "twilight" is unduly prolonged, that forceps deliveries are often necessary, and that a certain number of babies are asphyxiated? Is this proposition in agreement with modern obstetric tendencies which aim to make the act of parturition as natural and as free from artificial aids as possible? Are we not playing with fire in allowing a more or less superficial knowledge of this procedure to be spread broadcast among the profession and laity? Is a propaganda of this kind among women not likely to engender a hysterical and unwarranted fear of the highest function of their lives? Is it fair to womankind for reputable physicians, and here no reference to the ethical aspects of the case is intended, to urge upon the sex in the public press a demand for such a procedure in order to hasten its adoption and to denounce the objectors of their rose-colored propaganda with the statement that they are merely ignorant concerning the method? Thus far the daily press has been the forum for the more or less one-sided discussion by the advocates of "twilight sleep," and we have heard little by way of objection, for the honest objector hesitates to be subjected to ridicule because he has failed to become convinced of the value or necessity of the procedure.

We do not wish to condemn "twilight sleep" nor to detract from the honest claims made by those who state that they have tried out the method. The professional mind should be open to receive from legitimate sources any information which will tend to relieve human suffering. It should be free from prejudice, free from the desire of personal gain in judging the value of a new procedure, ready to discuss in a frank and open manner the pro and con

of the question, to employ the form of personal interview, the society meeting and the medical press, and not the medium of the popular press and the department stores. If medical opinion can be guided by an impartial study and trial of this procedure, the latter will not lack deserving attention, but the senseless reiteration of its wonders by writers and speakers, both lay and professional, such as have been published within recent months, may be justly regarded as undignified and questionable. If the production of a condition of seminarcosis as a routine procedure in normal labor is shown to be a desirable necessity, such a method will soon enough be adopted by the profession. Thus far the evidence adduced is not sufficient to warrant such a course. The indiscriminate employment of the method is bound to be harmful, will detract from its possible value, and will hasten its relegation to the great unknown where now repose so many exploded medical practices and fancies.

ANALGESIA AND ANESTHESIA IN LABOR.

The *American Journal of the Medical Sciences* for January, 1915, contains an article by DAVIS on this live topic.

The writer's experience in the management of labor has led him to adopt the following plan, and this statement is made to bring the matter clearly before us:

During the first stage of labor thorough emptying of the bowel by hot, high enema, frequent emptying of the urinary bladder, the use of bromides by the mouth, quiet if possible, and comfort for the patient, if it can be secured; and should these measures fail and the patient be threatened with exhaustion from irritation, morphine and atropine should be given hypodermically.

During the second stage of labor, when suffering predominates and uterine contractions are irregular, and evidently lessened by suffering, strychnine 1/60 to 1/30, digitalin 1/50 to 1/100, codeine ½ to ¼ grain, together, are given hypodermically. This dose may be repeated if necessary in an hour. When expulsion is imminent a small quantity of ether is inhaled at the height of the pain. At the moment of expulsion ether is given freely and quickly, producing a temporary anesthesia which soon passes by. When patients so treated are questioned they state that they did not know when the child was born and that its expulsion produced no sensation of suffering whatever. This treatment has not been followed by shock, headache, or nausea, has had no bad effect on the child, and in the writer's experience has given good results. It can be used in general practice, and ether can be entrusted to an intelligent person who will obey the physician's orders implicitly at the moment when the child is born.

We are all aware of the fact that chloroform in small quantities is rapid, powerful, and unirritating, but unfortunately it tends to produce uterine relaxation, and hemorrhage is more frequent after its use than when ether is given.

Large doses of opium or prolonged anesthesia undoubtedly affect the fetus, but in the writer's experience no serious result has followed from the ordinary and careful use of these drugs. In cases brought to hospital in impossible labor, where violent contractions threaten rupture, the writer frequently gives the patient ¼ grain of morphine hypodermically, and as soon as possible delivers her by abdominal section. In some cases the fetus is slow in breathing after delivery, but the writer recalls no case in which fetal death could be ascribed to the use of these drugs.

Those who are interested in the subject of spinal anesthesia will find in Gellhorn's paper, read before the American Gynecological Society last spring, an exceptionally clear and accurate statement concerning this matter. In common with that which has been stated, he notes the occurrence of severe headache and irritation in many patients, and states that the indications for spinal anesthesia for gynecological operations are the contraindications for inhalation anesthesia. This agrees with the conditions present in obstetric practice.

THYROID INSUFFICIENCY.

HERTOGHE, in the *Practitioner* for January, 1915, states that the main fact, that thyroid insufficiency is invariably accompanied by infiltration, must never be lost sight of. Under the influence of thyroid extract the infiltrates are absorbed and the patient loses weight. The weighing machine not only confirms the diagnosis, but it controls the conduct of the treatment.

Care should be taken to guard against the exhibition of thyroid extract in excessive doses; in other words, against the too abrupt withdrawal from the tissues of the fat, mucin, and other waste products by which they are distended. Over-rapid absorption is accompanied by pain in the muscles, ligaments, and joints, and this pain is sometimes more intense than that which obtains before treatment. The heart muscle is peculiarly liable, a fact which is alarming to patient and doctor alike. Too drastic a treatment may provoke cardialgia and tachycardia, which have all the appearances of hyperthyroidism.

Again, the sudden combustion of the infiltrated material may effect an abrupt transition from a state of hypothermia to one of hyperthermia, thus conveying the impression of fever, the symptoms being entirely due, however, to over-rapid oxidation. For both these reasons, courage to go slowly is essential. It is inadvisable for the patient to lose more than 3½ to 5¼ ounces a day. Even in the case of severely myxedematous adults, the writer never exceeds a dosage of three 5-grain tablets in the day. In slighter cases he gives either one or two tablets, according to the daily loss in weight. Children tolerate thyroid well, and one or two tablets may be given daily without fear of evil consequences. Children grow very rapidly under the treatment. As a general rule, a child in whom growth is arrested or very noticeably retarded will grow as much as from two- to three-fifths of an inch a month.

The method is essentially palliative in its action, and should be continued over a long period of time—a lifetime, in fact. The permanent dosage should be half the amount of the initial dose, and both should be controlled by the weight. As soon as the edema has completely disappeared, health is reëstablished. Assimilation and digestion become normal, and nothing will prevent the patient from putting on weight. This, however, is not a disquieting symptom.

It is expedient to accompany the exhibition of thyroid by a mild aperient, such as aloin or cascarin. Aloin is an excellent preparation, one pill of 1/25 grain being given each night. Liquid paraffin, which is a favorable method in England, is a valuable adjunct to treatment. The dose is about a tablespoonful night and morning.

The patient may eat everything, meat included. The writer always, however, advises that little sugar should be taken, and no alcohol in any form whatever. Cold baths and any kind of cold hydrotherapy should be absolutely forbidden. There is little wisdom in robbing the victim of thyroid inadequacy of heat; chilliness is his normal state. As a general rule, the infiltration of true myxedema disappears within sixty days.

Briefly, then, the rational method consists in the exhibition of thyroid extract in small doses; close attention to the weight and the regimen; and perseverance in the face of muscular and nervous cardiac pain, should such arise.

The results of treatment are of a nature to convince the most skeptical. Nothing is more striking than the return to health of a victim of grave myxedema. The hair grows, the expression becomes intelligent. In children, the increase in height is very striking. In women, the derangements of sexual activity are corrected, menstruation assumes a normal character, and the tendency to abortion disappears.

The writer has purposely refrained from discussing the other opotherapeutic measures which are sometimes employed in combination with thyroid extract. It is essential, in the first instance, to obtain an exact estimate of the value of thyroid extract alone. Later on variations are permissible. Other opotherapeutic extracts, such as ovarian, testicular, suprarenal, and pituitary,

are still very uncertain in their action. The writer is convinced that the best method of stimulating the ovary, testicle, suprarenal, and hypophysis is by way of the thyroid, which governs and controls all the internal secretory organs.

AUTOGENOUS SERUM IN THE TREATMENT OF PSORIASIS.

Fox, writing in the *Journal of the American Medical Association* of December 19, 1914, states that as a result of his own observations in a limited number of cases he would draw the following conclusions:

1. Autogenous serum, when used alone, does not appear to be of value in the treatment of psoriasis.

2. It is of decided value in many cases when used in conjunction with chrysarobin. Obstinate cases of psoriasis that have long resisted vigorous treatment with chrysarobin ointment will often yield to this remedy when injections of autogenous serum are given.

3. Intravenous injections of autogenous serum, if properly given, are entirely devoid of danger.

4. The technique of preparing the serum and giving the injections is comparatively simple.

TWILIGHT SLEEP.

Carter, in the *New Orleans Medical and Surgical Journal* for January, 1915, asserts that we may say that twilight sleep is a delirium. It is the very condition we strive to arrive at, but not the delirium we generally see in alcoholics; rather one of quiet and ease. Violence and wild delirium are due to giving too much of the drug, or giving it in too large a dose. If the patient is watched closely, and the proper amount of the drug administered with the right intervals, it should not cause any alarming symptoms. This does not hold good where there is an idiosyncrasy for the drug. Should the patient have had an overdosage, producing a state of wild delirium and violence, the writer does not think there would be any serious consequences to the mother or to the baby, but it would certainly require the most careful watching. One should be able to tell that the patient is narcotized long before the delirium sets in. The writer admits that this effect upon the family would probably mean the last case of twilight sleep in that family, and probably the loss of practice in that family.

The length of labor is most assuredly shortened. This is one of the reasons why men who have used the twilight sleep, and who have not gotten the results, condemn it. The reason is that their labors were so materially shortened that the scopolamine fell short of its time to act, before delivery took place. The writer has had a number of cases of this character in which the treatment failed, simply because it hastened the progress of labor to the extent that the drug did not have time to act.

A third of the writer's cases came to forceps, all being primiparæ. Naturally a great majority of the primiparous patients would come to forceps anyway. The writer thinks it unwise to let a head remain on the perineal floor for more than an hour before delivery is attempted. Probably if he had let some of his cases go longer they would have been delivered normally. The objection to the use of forceps is, therefore, an unjustified criticism. Are we practicing medicine to produce or relieve pain? Then why not relieve these patients of pain by the use of forceps? What would your patient say should instrumental delivery be mentioned to her after she has gone under a most strenuous effort at delivery with no result? She would consent to be delivered at once, every time.

These patients are better off in hospitals, and in hospitals especially equipped for this purpose. The writer believes the practice in the homes is just as suitable, and even more so, than in some of the hospitals of New Orleans. In New York City several of these cases were tested out in the tenement houses of the poor, where the very poorest of conditions prevail, and where the noise is something terrific. Still, up to the time that Carter left New York, several

cases had been given the twilight sleep in these houses with absolute success.

To sum up, for a case to be successful there must be the following requisites: A normal case; absolute quiet; a darkened room; absence from the room of all persons except the nurse and doctor.

Patient must be well in the first stage of labor, with a dilatation of the os not over three fingers in the primipara, and not over two fingers in the multipara.

The drug must be fresh. Careful administration and the necessary amount of the drug.

Finally, to know when the "Dämmerschlaf" condition is assumed by the patient.

THE TREATMENT OF TETANUS.

The *Lancet* of December 12, 1914, states editorially that at the meeting of the Medical Society of London an interesting discussion was held on the prophylaxis and treatment of tetanus, a subject of great importance at the present time when many wounded soldiers of the allied forces in Belgium and France have been suffering from this disease. The debate, which is reported in this issue of the *Lancet,* was distinctly a success; every speaker was well acquainted with his subject, and those who were present heard the very latest views of the mode in which tetanus is brought about, and first-hand opinions as to the best way of dealing with it. It was only to be expected in so difficult a subject, and one whose practical clinical experience has been on the whole so limited, that these opinions did not always coincide in detail.

The debate was opened by Captain Dennis Embleton, who had had opportunities both at the Third London General Hospital and at Netley of observing a series of cases presenting a varied picture of the disease. He dwelt on the improbability of any localization of the tetanus organism, and considered that carbolic acid, even pure and applied two minutes after the infection had been produced, was ineffective, while by damaging the tissues it might be dangerous. He held that the value of antitetanic serum for prophylactic purposes had been definitely settled, and that its administration in established tetanus had been proved experimentally to be of value when the subcutaneous route of administration was the safest.

Prof. F. W. Andrewes, who followed Captain Embleton, pointed out that it was by no means every wound, exposed to the possibility of infection by tetanus, that was really likely to be infected. The main source of the bacillus is to be found in the intestinal excretions of the ox and also especially of the horse, and therefore the mud of the roads is extensively impregnated with this germ; so, too, all soil that has been treated with stable manure must contain very many of the organisms. Dr. Andrewes described some experiments performed in this connection; he had taken some of the earth from his garden and had inoculated a number of mice with minute portions of it, and though in some of the cases the amount of soil used was extremely small, yet every single mouse had become infected with tetanus. However, though garden soil teems with this bacillus, it is extremely rare for any gardener to suffer from tetanus, though daily he must have superficial abrasions with which the bacillus must have been smeared. It appears, then, that superficial lesions are very unlikely to lead to the development of the disease, and this Dr. Andrewes is inclined to attribute to the fact that the bacillus of tetanus is anaerobic, so that free exposure to the oxygen of the air prevents the development of the organism. This free exposure to the air is, in his opinion, far superior to the employment of hydrogen peroxide or of potassium permanganate. This view did not commend itself to all the speakers, while Captain Embleton had previously laid great stress on the damage of the surrounding tissues as an important factor in the development of the germ, and especially in the associated inoculation of septic organisms.

As to the treatment, all the speakers agreed that the use of antitetanic serum far surpasses other methods that have been devised, and that hypnotic and sedative

drugs hold a very secondary place in treatment, though they might be useful in relieving pain, in allowing the reception of food, and in inducing sleep. It was also agreed that the serum should, if possible, be given prophylactically, but at once the difficulty arises that it is practically impossible to administer the serum to every wounded man, for the available stock of serum is utterly insufficient. How, then, can the suitable cases be selected? It seems that deep wounds are more likely to be affected than those which are more superficial, but some further differentiation is necessary, and Dr. Andrewes suggested that the demonstration of the presence of Gram-positive bacillus of Welch is very suggestive of the presence of the bacillus of tetanus, and so far as he has used this test it appears to be well founded. By some such method the number of cases to which the serum should be given prophylactically may be much reduced. When the dose of serum has been delayed for one cause or another till the symptoms become manifest its value is markedly reduced, but it may be given here with good effect if the dose is greatly increased.

The channel of administration has also to be determined. It is curious to note that while one observer favored the subcutaneous route another considered the intravenous method the best, and a third speaker held that the serum should certainly be injected into the subarachnoid space of the spinal cord; and with this last view we are inclined to agree if a prompt action of the serum be desired. The intracerebral injection found no supporter, though it was admitted that it might be employed in very serious cases as a last resource. The intracranial method must do immense damage to the structures of the brain, unless the quantity of fluid injected be limited to a very few drops.

It was clear from the whole of this very interesting debate, as well as from the differences of opinion upon the method of administering the accepted remedy, that our knowledge of the therapeusis of tetanus is still in a state of flux. We have in the antitetanic serum an agent of a high degree of potency. Further experience will show us how best it may be used, but at present it is abundantly clear that in its early prophylactic use lies the best hope of combating a deadly disease.

THERAPY OF FEVER IN PULMONARY TUBERCULOSIS.

The *Medical Record* of December 26, 1914, contains an article by PACKARD upon this subject. He well says that the artificial reduction of fever by drugs is a questionable procedure. If fever is a part of the defensive mechanism of the body, on theoretical grounds the use of drugs as antipyretics would be contraindicated. However, with the uncontrolled high fever sapping the strength of the patient, and producing distressing effects upon mind and body, one is justified in making a trial with them.

Unfortunately, results are not uniform. If an antipyretic effect is obtained, this is usually lost immediately on stopping the drug. Very frequently the unpleasant after-effects of the antipyretic are of more discomfort than the fever itself. Very rarely is a permanent lowering of the temperature seen after the administration of a drug.

Drugs which have a direct effect upon fever are the coal-tar and wood-tar derivatives. Their exact action upon the heat-regulating mechanism is not known, but following their ingestion decomposition products are formed in the tissues, and at the same time fever falls.

The various members of this group differ chiefly from each other in the rapidity with which these products are formed. A rapid formation leads to blood changes and collapse, while the antipyretic effect passes off quickly. Those drugs are found the most satisfactory in which this decomposition proceeds gradually, so that the temperature falls slowly and remains low for a longer time. A partial list of these drugs or their derivatives includes antipyrin, acetanilide, phenacetine, analgine, thalline, salophen,

salicylic acid, salicin, salol, aspirin, and pyramidon.

Probably the drugs used most frequently to-day for the reduction of fever in phthisis are pyramidon and aspirin. Both these preparations have held their own against all other drugs which have flooded the market. Pyramidon is best given in small doses (2 to 5 grains) in a glass of water, to be sipped over a period of three or four hours before the usual rise of temperature. The dose may be repeated in an hour. Aspirin is usually given in 5-grain doses, but frequently 2 to 3 grains will be enough to cause profuse sweating.

There are two points to be remembered in the administration of antipyretics: first, individuals vary in their susceptibility toward them, and secondly, patients using these drugs for any length of time acquire a tolerance toward them.

The disagreeable results attendant upon the use of antipyretics are sweating, chills, and depression. When the fall of temperature is rapid, sweating is very likely to occur, and the following rise of fever causes chills or chilliness. During the day after the use of these drugs there is often a marked mental and bodily depression.

New preparations aimed to produce antipyretic effects without the attending disagreeable symptoms are being added to the list year by year. A few of these newer drugs are: Melubrin, a substitute for aspirin, said to have a longer antipyretic effect; aspirin-calcium, which contains 10 per cent of calcium, and is said to be better borne than aspirin; hydropyrin grifa, a watery solution of the lithium salt of acetyl-salicylic acid (aspirin)—Neivling recommends it combined with arsenous acid in the chronic fever of phthisis; tropfenform, a preparation from ichthyol; and iodglidine, derived from iodine.

Good results are said to follow the injection (either intramuscular or intravenous) of colloidal copper (electrocuprol). Thirty-eight cases reported by Damask became permanently afebrile after three to twelve injections. Subcutaneous injections of 20-per-cent camphor oil twice a day have been recommended by Weihrauch; 20 per cent of his two hundred and forty-six cases so treated showed complete or partial reduction of fever after ten to forty injections. G. Schroeder was unable to convince himself of the usefulness of this remedy for fever.

Hartley has had success in treating febrile tuberculosis cases without a luetic history with neosalvarsan. His sixteen cases all showed a defervescence after from one to three injections. No severe reactions occurred, although some patients were in a far advanced stage. He recommends that this form of treatment be given a more extended trial among the febrile tuberculous.

The points to be emphasized in the therapy of fever in tuberculosis are chiefly these: First and foremost, absolute rest in bed, preferably out-of-doors; artificial pneumothorax in selected cases; a trial with autogenous vaccines, especially when there is copious purulent expectoration; the cautious use, if at all, of tuberculin, and then only after other measures have failed; hydrotherapeutic measures suited to the condition and comfort of the patient; an ample diet, but not necessarily "forced feeding;" and the judicious use of antipyretics.

INJURIES TO THE NERVOUS SYSTEM IN WAR.

LEWANDOWSKY (*Berliner klinische Wochenschrift,* Jahrg. 51, N. 51, 1914) states that the wounds of the brain, spinal cord, and peripheral nerves bear the raito to one another of 25:10:65. These wounds as seen at the base hospital do not differ in very great degree from those observed in those who make suicidal attempts during time of peace, because the severer forms of injury do not admit of removal of the patient beyond the field hospital. The common form of injury of the brain by rifle shot is that at the convexity with openings of entrance and egress of the bullet. The wounds may be diametric or tangential. Occasionally a wound of the base is seen. The chief difference from injuries in times

of peace is that, on account of the great penetrative power of the missile, it is not so often retained. There are many cases of injury to the brain by fragments of shrapnel or bomb which are often retained in the skull or brain. These fragments are detected by means of the *x*-ray. In all these cases the question arises as to whether the fragment should be removed or not. It is believed that there is no ground for removal of an aseptic foreign body from the brain; also in some cases there are so many fragments that their removal is impossible. In cases in which the foreign body can be easily reached it should be removed. If the body is deep seated it should be attacked only on some special indication, as, for example, the suspicion of abscess formation.

The skull seems to be the only region which modern war surgery can attack actively with good results. It is a matter of record that the surgeons in the field hospitals sometimes spend a whole day trephining skulls. When conditions preclude the possibility of surgical procedure in injuries to the skull the results are usually bad. In one instance, in which six of these cases were transported to the base hospital, two in which operation had been done healed promptly, while the other four became infected and three died of meningitis, while the fourth developed a brain abscess which necessitated operation. How operation shall be done depends upon the individual case. In tangential injuries operation is usually needed, as splinters of bone are driven deep into the brain at right angles to the point of injury. These injuries are often more severe and difficult to deal with than where the shot is in a diametric direction. An important question always is whether a case which has gone several days or weeks without operation shall be submitted to operation. If the case is progressing favorably, it is best let alone, but if there is some unfavorable sign, operation may be helpful. An injury to the brain must be kept under close observation for at least five to six weeks on account of the danger of meningitis or brain abscess.

As regards the prognosis of these injuries of the brain, it must be said that disturbances of speech and subjective sensation as well as forms of paralysis are apt to remain; epilepsy may result. As to relief of these by later treatment, it has been found in times of peace that operation is not usually successful in speech defects and epilepsy; in subjective disturbances, however, there is often a psychic factor which can be removed by appropriate measures. Contrary to the practice in case of brain injuries, the author believes that in spinal cord injuries operation is almost entirely contraindicated. This is in accordance with experience in times of peace. In reviewing the work of eminent surgeons in various large hospitals during the past ten years the author has found record of only one case in which operation upon the spinal cord has been followed by a successful result.

Injuries of the spinal cord fall into two classes, those of complete severance and those of injury to a portion of a cross-section. In the first the prognosis is absolutely unfavorable; the partial injuries offer certain chances without operation. Even when the physical signs and the *x*-rays point to the presence of a splinter of bone or a bullet in the cord, operation is not of avail because in such cases the destruction of the section of the cord involved is complete. In some cases the paralysis of the cord is only temporary, due to the fact that the cord has not been injured but has received only a shock. The most important feature of the treatment in these injuries is the prevention of decubitus and the protection of the bladder from infection. In case of injury to the cauda equina it is advisable to lay it open, remove scars, and suture the nerves.

Injuries to the peripheral nerves are much more frequent in war than in peace. Out of a half million wounded in the present war from 7000 to 8000 have had injuries to the peripheral nerves. Most frequently the arm nerves are involved; others prone to injury are the brachial plexus and the sciatic nerve; also the peroneal and the tibial. Not seldom the cranial nerves are involved. In only two cases has the author

seen injury to the nerve roots at their exit from the canal. The symptomatology offers nothing new except such phenomena as grow out of the multiplicity of nerve injuries. In diagnosis differentiation must be made between nerve injury and muscle injury; also, in atrophic cases, between injury to the nerves and simple atrophy due to joint involvement. This is accomplished by the faradic current.

Nerve injury is usually caused by infantry arms, seldom by shrapnel or bombs. It is not frequent to find the nerve severed; it is usually only partially torn. In many cases there is no direct injury to the nerve itself, the paralysis being due to infiltration in and around the nerve from an injury to the adjacent tissues. In some cases the nerve becomes embedded in a scar, and on this account demands operation. Persistent pain in the region of the nerve is an indication for exposing it and dealing with conditions as found. Although diagnosis of complete severance of a nerve is hard to make, when such diagnosis is made or this condition strongly suspected, the nerve should be laid bare, and, if found severed, should be sutured. Return of function in a severed nerve is very slow.

RADIUM TREATMENT OF MALIGNANT TUMORS.

Von Eiselsberg (*Archiv für klinische Chirurgie,* Bd. 106, Heft 1) states that he has used radium in a prophylactic way after operation, also as a purely curative measure. In every one of the four cases of carcinoma of the tongue in which radium was applied after operation recurrence took place. The amount of radium used was 225 mg. In eight cases of squamous epithelioma of the face or back of the hand cure occurred except in one aged person, who died of arteriosclerosis before the ulcer on his hand had quite healed. Good results were obtained in a case of inoperable cancer of the tongue and submaxillary glands, a case of round-cell sarcoma of the axilla, and a case of cancer of the neck which seemed to have its origin in an aberrant thyroid. In sixteen other cases of sarcoma or carcinoma of superficial parts of the body, chiefly the neck, tongue, lip, and mammary gland, the results were either temporary or negative. In seven cases of carcinoma involving the upper jaw, tonsil, tongue, mammary gland, and rectum, the results were negative. In five cases involving the tongue, cheek, mediastinum, brain, sphenoid, and rectum, the disease seemed to be hastened in its course by radium. In six cases the cachexia rapidly increased under radium applications. In five cases the radium caused serious or fatal hemorrhage by destruction of blood-vessels.

The influence of radium is very intense, but is not selective for carcinoma. In almost all cases the carcinomatous tissue is destroyed because it is less resistant. But it also destroys other tissue, as, for example, blood-vessels. When a case is inoperable for the knife it is as a rule beyond help by radium. If during an operation it is necessary to cut a large blood-vessel hemorrhage can be controlled, but if a vessel is eroded during radium application, the hemorrhage is often fatal because there is no preparation for controlling it. Radium destroys brain tissue and produces meningitis. Radium has influence only locally at the point of application; deep-seated carcinoma is not reached by it. The author hopes that the technique of using radium may be so improved that better results may be obtained from its use.

BOILING WATER INJECTIONS INTO THE THYROID GLAND FOR HYPERTHYROIDISM.

Porter (*Surgery, Gynecology and Obstetrics,* January, 1915) adopts the following technique: An all-glass syringe of 10-Cc. or 20-Cc. capacity is best. The greater the capacity of the syringe, the longer the heat of the water is retained. The needle should be long, flexible, and rather fine. The syringe is boiled with the water over a gas or alcohol flame by the side of the table or bed on which the patient is lying. After proper cleansing, the areas

to be injected are infiltrated with one-per-cent novocaine. The filled syringe is removed from the water, which is actually boiling, and the injection quickly made. From 5 to 20 Cc. are injected according to the size of the lobe. By partially withdrawing the needle and reinserting it, contiguous areas may be injected through one puncture.

Most patients complain immediately after the injection of a feeling of fulness in the goitre and some pain in the sides of the occiput, but the discomfort is really trifling.

The injections are to be repeated until the desired effect is attained. If one is using the treatment preparatory to thyroidectomy, then it is well to repeat the injections every two or three days, if more than one is necessary; but if one has decided to try to effect a cure by this means, it will be better to wait a week or ten days before repeating the injections, for, as indicated above, while the improvement is usually marked within the first forty-eight hours, it does not reach the maximum for ten days or two weeks.

It is better, especially in the larger goitres, to inject two, three, or more areas at one séance than to make the injections at intervals. The tendency is, as experience grows, to make larger and multiple injections at a single séance rather than to make smaller and single injections and repeat the séances. In some cases with small, ill-defined glands it is better to make the injections through a small incision in the midline, done under local anesthesia, which will enable the operator to do the work under the guidance of the eye.

The author feels that the clinical and experimental facts warrant the following conclusions:

Injections of boiling water into the gland should be substituted for the so-called medical treatment in patients with small thyroids and moderate symptoms of hyperthyroidism.

This method is also peculiarly well adapted to the treatment of patients with moderate or severe symptoms and relatively small glands, and especially to cases wherein the hyperplasia is circumscribed. It is therefore well adapted to the treatment of patients who have had a lobectomy done and are still suffering from symptoms of hyperthyroidism with hypertrophy of the remaining lobe.

Patients with large goitres and extreme symptoms of hyperthyroidism should be treated with the injections until they become safe surgical risks and then have the gland removed.

Boiling water injections are not recommended in non-toxic goitre. In such cases, as in patients with large goitres and toxic symptoms but who are good surgical risks, thyroidectomy should be the chosen method of treatment.

In substantial hyperactive goitres the removal of which would be hazardous, boiling water injections under guidance of the eye should be tried.

THE MECHANICAL TREATMENT OF COMPOUND AND SUPPURATING FRACTURES OCCURRING AT THE SEAT OF WAR.

JONES (*British Medical Journal*, Jan. 16, 1915) believes that the surgeon should abandon all operative methods designed to immobilize the fractured ends of bones in military surgery. Plaster of Paris becomes a filthy method when suppuration has occurred and should be entirely discarded. Fractures of the hip-joint, those just below the trochanter, are best treated by a modification of the Thomas splint, upon which the patient lies and can be carried. Extension is easily maintained and applied, and need not be relaxed for any purpose. The patient is placed upon this splint, and any displacement should be overcome by immediate extension in the abducted plane. The limb should be rotated inward slightly until the foot is at right angles to the table, and be fixed in this position on the frame. Both limbs are controlled, and extension is secured by strapping on the injured limb, with counter-extension by means of a smooth leather groin strap on the opposite side of the pelvis. This groin strap should not be slackened by the nurse under any pretext, but in order to avoid pressure sores she should be instructed to alter the area of

skin over the abductors, which is subjected to pressure, by moving it to and fro. This method of "fixed extension" in abduction secures the lower limb in relation to the pelvis in a manner which can never be satisfactorily achieved by weight and pulley, where reliance is placed on the weight of the body for counter-extension. It is by reflex nervous impulses, induced by changes of tension in the muscle, that muscular spasm is produced. A patient lying in bed with a fractured femur—high up or lower in the shaft—cannot avoid constantly changing the state of tension of the muscles of his thigh if a weight and pulley are attached to his limb. The counterpoise is the weight of his body. Every time he tries to shift the position of his shoulders by digging his elbows into the bed he alters the tension of his muscles, calling forth a reflex spasm. When he falls asleep and his muscles relax, when he moves in his sleep, when he is lifted upon a bedpan or moved slightly by the nurses to have his bed put straight, there is apt to recur this reflex contraction due to sudden change in tension.

The long Liston splint, which is much in use, is quite unsuitable for fractures of the upper thigh. It does not permit abduction, but maintains the limb in line with the trunk —a position which must result in angular union. Furthermore, as the splint extends to the axilla, any movement of the trunk involves movement of the limb, and attention to the secretions disturbs the fracture. Both the Liston and the ordinary weight and pulley are ill suited for any form of fracture with suppuration, where good alignment, comfort, and ease of transport are desired.

The patient who lies on an "abduction frame" can be lifted and moved without pain, without disturbing the fracture or relaxing the extension, and the dressing can be changed without interfering with the mechanism of fixation. If the wound is through the buttock and the discharge takes place there, the splint can be modified. The abduction frame can be applied in a few minutes.

For all other fractures of the thigh, the Thomas knee splint is incomparably the simplest and best. Jones has often fixed a fractured thigh in this splint, and sent the patient home in a cab. By reason of its construction it automatically secures a correct alignment, as any surgeon with a mechanical mind can see. Jones uses this splint for the treatment of all fractures of the middle and lower third of the thigh, fractures through the knee-joint, and fractures through the upper and upper middle portion of the leg.

The application of the Thomas bed splint is quite easy. Strapping of adhesive plaster is applied in the usual way to the sides of the limb. At the lower end of the extension strapping there is a loop of webbing to which is attached a length of strong bandage. The ring of the splint is passed over the foot and up the groin till it is firmly against the tuber ischii. The extensions are then pulled tight, the ends turned round each side bar and tied together over the bottom end of the splint, which should project 6 or 8 inches beyond the foot. Care must be taken to avoid internal or external rotation of the limb, the foot being kept at right angles. Local splints can then be employed, and are made of block tin or sheet iron. They can be molded by the hand to fit the limb, and yet, being gutter-shaped, they are rigid longitudinally. They can be disinfected by fire or water. A couple of transverse bandage slings suspend the limb from the side bars of the knee splint. A straight splint is placed behind the suspensory bandages of the thigh and knee. On the front of the thigh another sheet-iron splint is applied, and the femur is thus kept rigid. The alignment from the hip-joint to the ankle is perfect, being dependent on a straight pull. This splint allows the patient to raise his shoulders, or even sit in bed. His other leg can be moved freely without altering the tension on his thigh muscles, and there is no reflex spasm. Even if the muscles try to contract they cannot, for the ring of the splint is firm against the tuber ischii. The muscles therefore do not remain on the alert, but become quiescent, and starting pains do not

occur. Such is the difference between "fixed" and "intermittent" extension.

In using this splint a little attention is necessary to prevent soreness of the perineum. The ring of the splint, being covered with smooth basil leather, can easily be kept clean; so can the skin. The nurse should also several times a day press down the skin of the buttock, and draw a fresh part of the skin under the splint. To change the point of pressure over the perineum the limb can be elevated or abducted. The dressings can be applied without in any way interfering with the work of the splint. When the fracture has occurred through the knee or upper tibia the splint is applied in the same way.

It has often been a matter of astonishment to the author that so simple and effective a splint has not been universally employed. It can be applied in a few minutes, usually without an anesthetic, and one is always sure of good length and good alignment. The fractured limb can be moved in any direction without giving pain, so that transport is easy and safe. He has never yet had to plate or wire a femur in a recent case, and this he ascribes to using the Thomas splint.

Fractures of the lower portion of the tibia or fibula and fractures through the ankle-joint he treats in a skeleton splint. It allows of easy access to the wound and can without difficulty be modified to suit a special case. Fortunately, in gunshot wounds, the spiral fracture is rare, and, generally speaking, one bone remains unbroken. The treatment, therefore, of fractures of the leg does not present so much difficulty as that of the thigh. For transport, however, and for general comfort, the splint should immobilize the knee.

Fractures through the shoulder-joint and through the surgical neck of the humerus require no splints. The elbow should be slung at right angles and fixed by a broad bandage to the side. The dressings would probably replace the usual pad in the axilla, which should never be bulky. Shoulder shields are unnecessary and cumbrous. The patient, where practicable, should be treated in the upright position, and should have his head and shoulders well propped at night.

Where ankylosis is to be expected after a bad smash and suppuration of the shoulder, and opportunity is afforded for continuous treatment, the arm should be kept abducted slightly forward, and slightly rotated inward. This assures a much extended range of movement at a more useful radius, such range of movement being brought about by the action of the scapula. This position need not be adopted if the patient has to be transported, as it can be established after the arrival home.

Fractures through the elbow or immediately above the condyles are best treated without splints. If possible, the arm should be kept well flexed above a right angle. Suppurating cases in the adult will not admit of the very acute flexion which we insist upon in the case of children. If, for a rare reason, a splint has to be applied, the internal wooden angular splint must be avoided, because it is always clumsy and often causes deformity.

Fractures of the middle and lower middle portions of the shaft of the humerus, where dressings have to be frequently changed, require very gentle handling, and Jones gives illustrations of two splints which may be found very useful. One is a modified Thomas knee splint used to maintain extension in the abducted position, the patient being recumbent. The other is a modified Thomas humerus extension splint, to be used when the patient can walk about or sit up in bed. Either splint permits of easy dressing, and maintains adequate fixation. As so much destruction of bone may be produced by modern shrapnel, and even by rifle bullet, great care must be taken to prevent overexertion, otherwise non-union will ensue.

The chief disability to be feared in fractures of the shafts of the bones of the forearm is inability to supinate the forearm completely. The trouble usually arises when both bones are broken, but it may occur when the radius alone is involved. We must remember that the whole length

of the posterior border of the ulna is subcutaneous and is practically straight. On this straight ulna the curved radius rotates like the handle of a bucket. We must therefore attend to two points: first, we must keep the ulna straight; second, we must not interfere with the natural curve of the radius. That is to say, there must be no lateral pressure of bandage or splint on the middle of the shaft of the radius. In dealing, therefore, with these fractures, whether one or both bones be broken, the position of supination should invariably be maintained. This is even more important in septic compound fractures than where no complication exists. Neglect of this important point will often result in a locking of the bones in pronation. We must remember that in nearly all neglected fractures of the forearm, supination and not pronation is defective.

Jones has seen several cases of gunshot wounds through the wrist, and they have been mostly treated with the hand in line with the forearm—that is, midway between palmar and dorsiflexion. This is fatal to a useful joint. In order that the fingers may maintain their grasping power, all injuries of the wrist-joint should be treated in the dorsiflexed position.

A CONSIDERATION OF THE ANTISEPTICS USED IN THE TREATMENT OF INFECTIONS OF THE GENITO-URINARY ORGANS.

RAVOGLI (*American Journal of Surgery*, January, 1915) reviews the antiseptics used by ingestion through the mouth and by local application. Of the mouth antiseptics he gives highest praise to hexamethylenamin or urotropin. Concerning the value of the vaccines he expresses proper doubts. He places great confidence in the local treatment by means of instillations or irrigations with local antiseptics.

Aluminum acetate is useful in colon bacillus infection. Clinically it has given good results in 2-per-cent solutions. Instillations of 1- to 3-per-cent protargol, or more often of 20-per-cent argyrol, have been used. Of course no antiseptic has much value unless means to remove the source of infection are used. A good drain is obtained by the catheter left permanently in the bladder. The removal of infected secretions from the spermatic vesicles by means of digital massage is often of great benefit, as in those organs infections are maintained and the urine spreads infection to the bladder and to the other parts of the genito-urinary tract. If strictures are present they must be dilated or cut. In cases of deep infection, the old standby, chinin, surpasses any other internal antiseptic, and repeated irrigations with solutions at different strengths of potassium permanganate excel any other local applications.

BLOOD TRANSFUSION.

DEAVOR (*American Journal of Surgery*, January, 1915) from his recent work along this line has reached the following conclusions:

That blood may be carried from one individual to another through unlined metallic or rubber tubing, maintained at body temperature, without danger of clotting, if the anastomosis is made promptly. Long exposure of the field to the air and tedious manipulation are to be discouraged. The tube must be kept scrupulously clean. The blood serum adequately lines the tube.

That the amount of blood passing over from the donor to the recipient may be accurately determined by knowing the donor's pulse-rate, and the quantity discharged by a series of ventricular contractions.

That the field of application should be enlarged to include any condition which might be benefited, even to a small degree. All things considered, the indications for transfusion may be left to the judgment of the operator, who should know something of blood-vessel surgery.

That, in the absence of hemolysis, blood, after transfusion, is immediately taken up by the recipient and utilized as blood. If any change occurs it is a gradual one, which has not as yet been determined.

That our experience with whole blood,

perferably arterial, has been so satisfactory that we have not often had to resort to the more complicated process of defibrination.

That the method to be recommended is the one which requires the fewest assistants, creates the least excitement, fulfils the desired purpose, and can be applied with the slightest disturbance to the blood contents.

That blood transfusion is not, strictly speaking, a cure for any pathological condition, but rather a therapeutic help to other means of treatment. Its indication may even be replaced, occasionally, by saline instillation. Yet there have been times when, death being imminent, transfusion has seemed to be one link in the chain of events without which a life would surely have been sacrificed. He therefore cannot take the unusual position held by some and dispose of transfusion as a useless procedure, nor vie with the enthusiastic worker and recommend its practice too freely; but with an open mind, as if searching for truth, he would carefully consider each case, in full view of the fact that blood is a complicated tissue about which there is yet much to be learned.

That transfusion of blood is not devoid of danger; and while frequent performance improves the dexterity and skill of the operator, it does not relieve him of the peculiar responsibility which attends this apparently trivial operation.

THE PROPER DEPTH OF ANESTHESIA.

GATCH (*American Journal of Surgery*, January, 1915) believes that full relaxation, whilst possibly expediting the work of the surgeon, is an extremely potent means of favoring shock. He holds that light anesthesia is the desideratum.

It is a well-known fact that the blood-vessels are capable of holding several times the entire amount of blood. Since the arteries must always be full, it is evident that the veins and capillaries are not, and it is also evident that the mechanism by means of which the blood is prevented from accumulating in the latter vessels must be essential to life. That muscular contraction is the chief force involved in doing this is proved by the following considerations:

The veins of the limbs are provided with valves situated at short intervals apart and arranged so that every force that compresses the veins forces the blood toward the heart. When the valves become incompetent serious venous dilatation occurs, as in varicose veins of the leg. The mechanism just described is powerful enough to raise the blood-pressure in the veins to several times the height of the arterial blood-pressure, as shown by direct experiment.

The intra-abdominal veins are destitute of valves, and since these vessels alone can hold more than all the blood in the body, something must prevent their filling. This is usually supposed to be accomplished by the vasomotor mechanism. But that this alone is incapable of preventing a fatal stasis of blood in the abdominal viscera is shown by the following experiment: A dog is etherized till muscular relaxation is produced. Its arterial blood-pressure is recorded. That its vasomotor mechanism is acting well is shown by the maintenance of a normal blood-pressure, and by a rise of blood-pressure during asphyxia. The dog is now placed in a vertical head-up posture. The blood-pressure rapidly falls and is soon almost to the base line. On placing the animal in the head-down posture its blood-pressure quickly reaches the normal level. Salt solution is now injected into the animal's peritoneal cavity till its abdominal walls are distended. If the animal is now placed in the vertical head-up posture, little or no fall of blood-pressure occurs. Similar results may be obtained by the use of curare.

This experiment shows: The inability of the vasomotor mechanism to prevent a fatal stasis of blood in the abdomen, and the ability of an adequate intra-abdominal pressure to do so. Since this pressure is normally due to muscular contraction, the rôle of the latter is evident. Thus it is possible to produce fatal "shock" by deep anesthesia combined with the head-up posture. When we abolish muscular tone

there is an accumulation of blood on the venous side of the circulation, and the effect of this is practically that of hemorrhage.

The writer is convinced from both clinical and laboratory experience that operating for ten minutes with the patient under profound anesthesia may do him more harm than operating for an hour under light anesthesia. During a prolonged period of complete muscular relaxation so much blood may be withdrawn from the circulation that all the tissues suffer from a diminished blood supply.

THE ANTISEPTICS OF WAR.

CHEATLE (*British Medical Journal*, Dec. 12, 1914) states that many wounded have arrived in his country in a disgraceful condition after the early application of iodine. He believes that iodine has proved a failure in treating large wounds. He states that he has made perfect a better solution than iodine. It is more efficient and absolutely non-irritating, and can be applied safely to the scrotum, eyelid, and other parts liable to show the results of irritants. Pure carbolic acid cannot be applied to skin, and there is every reason to be convinced that, in a wound splashed with mud, the mud and the bacteria it contains are also on the surrounding skin. A friend of the writer's blistered his skin with pure carbolic acid, although it was at once washed off with spirit. The author has seen cases become infected with B. pyocyaneus, although washed with saline solution and hydrogen peroxide. The B. pyocyaneus at once disappeared on the application of 1-in-2000 mercury perchloride, or on the application of the rosaniline solution. He does not like the constant application of hydrogen peroxide to wounds; the granulation tissue under its influence becomes anemic and swollen. It may have its uses in removing blood-clot and sloughs, but that is another matter.

Cheatle's solution is a mixture of 1-to-20 carbolic acid and 1-to-500 mercury perchloride in absolute alcohol. It is colored with rosaniline.

NITROUS-OXIDE DOSAGE IN ANESTHESIA.

CONNELL (*American Journal of Surgery*, January, 1915) writing upon nitrous-oxide dosage in anesthesia holds that the proportion of gases in tidal air is the only available standard of qualitative dosage.

The intensity of the anesthetic action of nitrous oxide is in a measure inversely as the quantity of oxygen with which it is administered. The effect varies from a blunting of pain sense, obtained by administration with percentage of oxygen exceeding that of normal air, down through increasingly anesthetic action, obtained by a percentage of oxygen half that of normal atmosphere; thence down through an increasingly anesthetic and asphyxial action, until finally, with a percentage of oxygen about one-third that of normal air, the asphyxial effect renders the mixture so dangerous that it may be termed unrespirable. The effect of dosage may therefore be tabulated within certain limits, according to the relative percentage of the two gases maintained for respiration.

Additionally the anesthetic action of nitrous oxide is in a measure directly proportional to the tension of the gas dissolved in the arterial blood and central nervous system. Indeed, any appreciable dilution of the anesthetic mixture by an inert gas such as nitrogen so lowers the volumetric proportion of normal atmospheric pressure sustained by nitrous oxide in the lungs, and results in such low gas tension of nitrous oxide dissolved in the blood, that satisfactory anesthesia cannot be induced.

With nitrous oxide, since its efficiency is in larger measure proportional to the deprivation of oxygen, it seems desirable, until further work on the nitrous-oxide tension of the blood has been done, to measure and tabulate dosage in terms of relative volumes of nitrous oxide to oxygen in the inspired tidal volume.

It must be recognized that the proportion of gases in the tidal volume is only an approximate index of the proportion of available gases which reach the central nervous system.

In normal man of average tidal volume the effect of a given proportion of gases can be foretold to a nicety, and in the exceptions noted above the proper level is very quickly found. By the use of a measuring instrument of precision for quantity of each gas as it flows to the patient the administration for a given depth of anesthetic becomes almost a rule of thumb and an automatic procedure.

If it is conceived for purposes of observation and tabulation that the various stages of nitrous-oxide anesthesia, from slight blunting of pain sense to profound asphyxia, may be plotted as on a surface into continuous areas, each marked by definite physical reactions and each induced and maintained by definite proportions of nitrous oxide and oxygen, then these areas may be termed zones of anesthesia.

These zones were all determined without supplemental narcosis. It may be mentioned in passing, as a point frequently overlooked or misunderstood by the more fanatical devotees of nitrous oxide, that without supplemental narcosis for resistant subjects no zone exists in the range of true nitrous-oxide anesthesia, which is surgically desirable.

The lethal zone: Equilibrium can never be said to be established in this zone, as fatal asphyxia supervenes in from two to six minutes. While the percentages of this zone are in common use for short operations, such as extraction of teeth, yet the asphyxial mixtures of this zone should be abandoned for those which induce anesthesia more slowly and safely. Anesthesia induced by the percentage mixtures of the lethal zone subjects the patient to severe cardiovascular strain, and carries him to within a minute or two of death from asphyxia.

The profound and deep zones also have no proper surgical indication. They are frequently invaded by error during the routine administration, and are rapidly retreated from by raising the percentage of oxygen when oncoming asphyxia is observed. By intratracheal insufflation of the mixture a dog may be kept alive in the profound zone for half an hour. Man may be carried in the deep zone if the tidal volume be large and no asphyxial obstruction or thoracic fixation presents, yet the margin of safety is small.

The medium zone: The percentage of mixture even in this zone is advisable only for the first few minutes of induction, as the zone yields an undesirable degree of asphyxia characterized by a slight cyanosis, occasionally muscular rigidity, by stertor and by cardiovascular strain. Some anesthetists utilize the physiologically disadvantageous asphyxia of this zone erroneously for additional degrees of relaxation in resistant subjects, but this can only be secured safely by raising the percentage of oxygen and by supplemental narcosis; such narcosis as is attained by a small addition of ether.

The light zone: This is the one of greatest utility for abdominal surgery. The perfect relaxation of the hydrocarbon anesthetics is never seen. Reflex muscular and respiratory reaction to trauma is always evident unless blocked by local analgesia or by a more effective general anesthetic, such as small doses of ether or a large dose of morphine.

The very light zone: This is the desirable one for surface surgery such as amputation of the breast. Both this and the subconscious zone may serve for all degrees of operative work when supplemented by ether. In fact these are the ideal zones physiologically, since in these zones the blood-pressure is not raised, the color is normal or even rose-pink, the breathing is not exaggerated, and there is no asphyxia present.

The percentage of oxygen needed in the inspired gases is approximately in direct ratio to the degree of anemia, or intoxication. For example, a patient with 50 per cent hemoglobin, or half the normal oxygen-carrying capacity, requires for the zone of light anesthesia 18 to 20 per cent of oxygen in the tidal volume of respiration, instead of the 11-per-cent mixture required by normal man.

The stimulus of operative trauma elevates the blood-pressure 10 to 30 milli-

meters in all zones, even in the zone of profound anesthetic-asphyxia. Nitrous oxide has not the slowly induced ether effect in blocking efferent sensations of the somatic nerves by direct action on the nerve ends. Nor does it compare in efficiency as to central nerve cell disassociation with full ether anesthesia. The maximum nitrous-oxide effect is about equivalent to the ether effect obtained by 30 millimeters of ether tension; whereas full anesthesia under ether with complete disassociation of all the central nervous system from the great primative medullary centers is accomplished by 50 to 52 millimeters of ether tension in the central nervous system, as has been shown in the anesthetic tension investigations of Boothby. Therefore, nitrous oxide provides no zone which protects against harmful stimuli of operative trauma as do the hydrocarbon fat-solvent anesthetics. Nitrous oxide should therefore be employed only with the gentlest manipulation of tissue by the operator, or where there is supplemental blockage of centripetal stimuli by local analgesia or by a more effective general anesthetic such as ether, or deep narcosis by morphine or scopolamine.

Connell concludes his study as follows:

The effect of a given nitrous-oxide-oxygen mixture is constant on normal man.

The anesthetic effect is in a degree inversely as the proportion of oxygen.

The ultimate gas tension which the drug establishes is not at present an available gauge of dosage.

The only available gauge of qualitative dosage is the proportion of oxygen with which the drug is administered.

The action may be differentiated into consecutive levels or zones of anesthesia, according to the average amount of oxygen present in the tidal gases. For analgesia in normal man the proportion of oxygen in the tidal gases of breathing may exceed 20 per cent. Below this the consciousness becomes gradually abolished until at 16 per cent the patient slowly becomes unconscious. From 14 to 11 per cent there is sufficient anesthesia for surface operations; from 11 to 8 per cent there is sufficient anesthesia for abdominal surgery, associated, however, with slight asphyxia and without proper muscular relaxation. Below 8 per cent the mixtures are useful only for induction of anesthesia, and below 6 per cent they become so highly asphyxial that they should not be used even for tooth extraction.

Higher percentage of oxygen is required when the tidal volume is below the average. or the oxygen-carrying capacity of the blood is diminished.

At least 6 liters of fresh gases per minute is required for smooth anesthesia; and to establish normal excretion of carbon dioxide and other gaseous waste products preferably 8 to 10 liters per minute of a uniform mixture should be supplied in a continuous flow.

By continuous flow and known dosage with accurate and constant measurement and control the level of each patient may rapidly be found, and after the first fifteen or thirty minutes anesthesia may run continuously without further adjustment.

Unsupplemental nitrous-oxide-oxygen anesthesia is ineffective to block the centripetal stimuli of operative trauma.

Nitrous-oxide-oxygen anesthesia is most advantageously supplemented by ether.

Light ether anesthesia, the light subconscious zone of ether, a tension of 15 to 25 mm. in conjunction with the subconscious or light subconscious zones of nitrous-oxide-oxygen anesthesia, 14-16 or 16-20 per cent of oxygen, is physiologically the most advantageous of all anesthetic states.

Owing to present complexity and inaccuracy of administration, the average nitrous-oxide anesthesia, even when effectively supplemented, possesses no practical advantage over properly induced and well-maintained ether anesthesia.

ACUTE AND CHRONIC EMPYEMA.

WHITTEMORE *(Boston Medical and Surgical Journal,* Feb. 4, 1915) has traced, as far as possible, the end results of the cases of acute and chronic empyema operated on at the Massachusetts General Hospital dur-

ing the period of ten years from January 1, 1901, to January 1, 1911.

There has been a high mortality in the acute cases, and a good many of them have become chronic. In going over the records of some 269 cases, and seeing many of those who return in answer to letters sent to them, he has tried especially to find out why the mortality was so high and how it might be reduced.

During this period of ten years there were 269 cases of acute empyema operated on. He has traced the end results in 154 of these. The remaining 115 cases he has been unable to trace; letters have been sent to the patients, then to family doctors, and finally to town clerks, but without success. A large number of patients were foreigners, and they have probably drifted to other towns.

Out of the 154 cases that have been traced, there were 54 that died following operation, giving a mortality of 20 per cent. One hundred cases left the hospital alive; 68 are well at the present time. By this he means that there is no discharging sinus, no bad effects from the operation, and the patients are able to attend to their regular occupations. Twenty cases have become chronic; these have a persistent sinus and a cavity with a much thickened pleura, as a rule. The remaining 12 have died since leaving the hospital: one died from an accident, one from diphtheria, three from kidney disease, one from tuberculosis, one from scarlet fever, one from meningitis, one from heart disease; in three cases the cause of death is not known. There has been apparently no connection between the cause of death and their empyema.

An autopsy was performed on 30 of the cases that died following operation: 14 died from septicemia, five from pneumonia, three from pyemia, one from peritonitis, two from multiple abscesses of the lung, one from defective closure of the foramen ovale and thrombosis of the left pulmonary artery; in four no definite cause was found. The commonest cause of death was septicemia, the majority being streptococcus septicemia and a few pneumococcus septicemia. Whittemore stated that he could not report on any definite cause in the other 24, as there were no autopsies performed on these.

There were 35 cases of chronic empyema operated on during this period of ten years. He has traced the end results in 23: 15 are entirely well; four did not improve by operation—that is to say, they have a persistent sinus and are practically chronic invalids; two cases died following operation; two cases have died since leaving the hospital, cause of death not known. Of the two cases that died in the hospital, one had an autopsy performed, the cause of death being adenocarcinoma of the main bronchus and extensive bronchiectasis.

Many of the cases were desperately sick when they reached the surgeon, having had a severe pneumonia.

The author feels that the cause of many of the bad results was that the diagnosis was not made early enough and that the operation was not done soon enough. The earlier the diagnosis and the earlier the operation the better. He believes that one should operate when aspiration shows the serum to have a good many leucocytes in it rather than wait until it becomes pus.

A good many cases are not drained at the bottom of the cavity, so that there is a certain collection of pus that does not drain easily. If in exploring a cavity through the first incision one is not at the bottom, he believes a second incision should be made, provided the patient's condition allows it.

SOME ELEMENTARY FEATURES OF THE X-RAY DIAGNOSIS OF GASTRIC CARCINOMA, GASTRIC ULCER, AND DUODENAL ULCER.

CARMAN *(Canadian Medical Association Journal,* January, 1915) observes that *x*-ray distinction of the pathologic from the normal is not very difficult, but distinction of the pathologic from the reflex is often troublesome. These reflex manifestations, which are commonly of a spasmodic character, occur frequently in association with disease of the gall-bladder or appendix, and occasionally in neurasthenia, tabes, intoxica-

tions, renal calculus, and other conditions. They produce the most numerous and most deceptive counterfeit of pathologic signs, and their careful exclusion is always essential. In his own series of cases definite signs were found in 93 per cent of the gastric carcinomas, 83 per cent of the gastric ulcers, and 50 to 60 per cent of the duodenal ulcers.

His technique is in essence a combined fluoroscopic and skiagraphic examination with a double opaque meal. After a castor-oil purge the evening previous the patient is given cereal containing two ounces of barium sulphate. Six hours later, having fasted meantime, he is examined with the screen, during which he is given two ounces of barium sulphate in eight ounces of water, followed by two ounces more in a pint of potato-starch pap, after which plates are made. With the test breakfast the motility of the stomach is determined, and a distinct residue after six hours is significant of impaired clearance, nearly always from organic cause. The purpose of the barium water is to fill in minute recesses and to visualize the pyloric canal and duodenum, while the pap, by holding the barium in suspension, outlines the entire stomach for screening and plating.

A normal stomach may be roughly defined as either steer-horn or fish-hook form, usually the latter, capable of emptying itself within six hours, its contour unbroken save by peristaltic waves and certain normal incisuræ, its tone sufficient to maintain a more or less tubular form, and its walls flexible and mobile to palpation. Its position is quite variable within normal limits.

The principal radiologic sign of cancer of the stomach is the filling defect, an irregularity of contour produced by the thrust of the tumor mass into the gastric lumen. The medullary type generally produces gross, multiple, shaded, localized irregularities, while the scirrhous cancer often shows rather smooth but extensive narrowing of the gastric caliber. Though cancers may be seated in any part of the stomach, the majority are found in the pyloric portion. In these cases the pyloric end may be apparently obliterated by the growth, or the lumen may be reduced to a narrow spicule. An extensive filling defect in the mid-portion of the stomach may produce an hour-glass form, the canal joining the two segments being usually central, long, and slightly irregular.

When spasm is suspected to be a cause of deformity it may usually be relaxed by the administration of belladonna or atropine. The alterations of the pyloric functions in carcinoma may be expressed in the form of a gaping, permitting a free and continuous flow of the opaque ingesta through it. In other cases pyloric obstruction develops, as evidenced by a distinct residue from the six-hour meal. In non-obstructed cases, hypermotility is commonly observed, the "head" of the six-hour meal being found in the transverse colon or farther, whereas under normal conditions it is usually seen at or near the cecum. The peristaltic activity of the carcinomatous stomach is markedly diminished as a rule, although exaggerated peristalsis has been noted exceptionally in obstructive cases. In these cases, also, anti-peristalsis has occasionally been observed. Interruption of peristaltic waves by carcinomatous infiltration is an important sign; the wave progresses to the affected area, skips over it, then takes up its course beyond.

Lessened motility is also observed, but of much greater importance is the diminished flexibility of the infiltrated gastric wall, the palpating finger making little or no impression upon the gastric outline.

The radiographic signs in syphilis of the stomach cannot be distinguished from those of carcinoma.

The cardinal and pathognomonic signs of ulcer of the stomach are the niche and the accessory pocket, showing as additions to the gastric contour, and representing the excavation produced by the ulcer. The niche, a bud-like projection from the bismuth-filled lumen, lies wholly within the gastric wall, and is an index either of penetrating ulcer or of a perforating ulcer which has not excavated an adjacent organ. The accessory pocket, sometimes spoken of as a "diverticulum," is a pouch-like excavation

resulting from extension of a perforated ulcer into near-by tissues, usually the liver or pancreas. Accessory pockets range in size from that of a filbert to that of a walnut. These accessory pockets may retain barium after the stomach is empty. If the pocket be in the liver it may move with respiration; in the pancreas it does not. Signs which have varying value in less advanced ulcers are incisura, hour-glass stomach, residue in the stomach after six hours, pressure-tender point, acute fish-hook form of the stomach with displacement to the left and downward, lessened mobility, hypotonus.

The incisura is a non-moving indentation of the greater curvature, opposite an ulcer, usually deep and narrow, but not always so. It is supposed to be due to a local spasm of the circular muscular fiber. False incisuræ usually disappear after the administration of an antispasmodic.

The major radiographic signs of duodenal ulcer are gastric peristalsis, with or without a six-hour residue and the accessory pocket of perforating ulcer. The minor signs include gastric mobility with early free opening of the pylorus, a rapid clearance of the stomach, gastric hypotonus, irregularities in the outline of the bulb or of the duodenum, lagging of bismuth in the duodenum, reflex gastrospasm producing hour-glass contraction or transient incisura. Gastric hyperperistalsis is a particularly valuable sign in duodenal ulcer. When found in conjunction with a six-hour gastric residue it is almost certainly diagnostic. Deformity of the duodenal outline, especially the bulb, as a pathognomonic sign of duodenal ulcer is not trustworthy. It may be due to spasm or adhesion. Duodenal ulcers never result in carcinoma.

THE TREATMENT OF SEBORRHEIC KERATOSES.

SUTTON *(Journal of the American Medical Association,* Jan. 30, 1915) notes that seborrheic keratoses begin as small brownish macules, the favorite sites being the face, scalp, trunk, particularly the interscapular and sternal regions, and the backs of the hands. When fully developed they are flat-topped, papular elevations, usually oval in outline, yellowish, grayish or brownish in color, sharply circumscribed, and covered with a firmly adherent crust, which is usually greasy and velvety, if the lesions are situated on the trunk or scalp, and harsh, rough, and dry if they are located on the face or hands. Preceding slight injury, such as a razor cut, is often noted. This lesion may persist indefinitely without change, but generally, and especially in those instances in which the growths are exposed to constant or repeated irritation of any sort, the bases of some of them undergo further pathologic change and ultimately become malignant, the resulting carcinomas invariably being of the prickle-cell type.

The earlier lesions are easily removed by the application of a bland grease, such as rose-water ointment. Afterward the occasional employment of a lubricant of this kind will prevent a recurrence, provided care is taken to avoid the use of hard water and highly alkaline soaps. The nevoid, verrucose, and advanced keratoid types are more resistant to treatment, and a salve consisting of salicylic acid (1 part), sulphur (1 part), and petrolatum (30 parts) is generally required to remove the outer layers. This ointment may be applied on cloth at night, the patch being covered with a bit of oiled silk, and the whole held in place by a cross of adhesive plaster. As soon as the corneous mass is softened, it may be gently removed with a bit of cotton moistened with benzine. Of all the caustics employed in this condition none equals carbon dioxide snow. One thorough freezing, with moderate pressure, for a period of from thirty seconds to one minute, is usually all that is required. The lesion is then painted with tincture of iodine or similar antiseptic, or a 5-per-cent ammoniated mercurial ointment may be prescribed. If the growths have already assumed a malignant character, the treatment is that of carcinoma of the skin. On the face, and particularly in the nasal and orbital regions, admirable results can often be obtained by the use of the Roentgen rays or radium.

REVIEWS.

NERVOUS AND MENTAL DISEASES. By Archibald Church, M.D., and Frederick Peterson, M.D. Illustrated. Eighth Edition, Thoroughly Revised. W. B. Saunders Co., Philadelphia, 1914. Price $5.00.

The first edition of this book appeared in 1899, and any work dealing with so special a subject which is sufficiently well constructed to reach an eighth edition in this space of time must be so compiled and contain very valuable information in such a form as to be deserving of continued popularity. It is interesting to note that one of the subjects about which we thought we knew much a few years ago has, since the last edition was published, required careful revision and thorough study, namely, syphilis of the nervous system; for in its etiology, pathology, and treatment it has become greatly modified by Noguchi's discovery of the spirochætæ in the perivascular tissues of cases of advanced nervous syphilis.

It is to be clearly understood that the book is not a joint work, but that Dr. Church has contributed the first part of the book, dealing with Nervous Diseases, and that Dr. Peterson has written the remainder, dealing with Psychiatry. That is, Dr. Church contributes the first 674 pages, and about 230 pages are contributed by Dr. Peterson.

The book is freely illustrated, many of the illustrations being taken from actual cases. Some of them, however, showing the condition of the mouth and hard palate in cases of mental disease, are not up to the average. Indeed, it may be considered that all of the illustrations in that part of the book dealing with Psychiatry are inferior to those contained in that portion devoted to Nervous Maladies, as, for example, figures 301 and 302.

DIABETES MELLITUS DESIGNED FOR THE USE OF PRACTITIONERS OF MEDICINE. By Nellis B. Foster, M.D. J. B. Lippincott Company, Philadelphia, 1915.

The somewhat curious title of this book, indicating that Diabetes Mellitus is designed for the use of practitioners of medicine, rather than that it is a book so designed, strikes one's attention as soon as the first page is read. The author has attempted in 14 chapters, or in 240 pages, to deal with a subject which is still largely an unknown field. It is difficult to determine what should go in a book dealing with this important subject. It is quite possible to compile a volume of 1200 or 1500 pages and still not exhaust a consideration of the best researches which have been made in connection with glycosuria and diabetes. Such a volume, however, would be too complete for the average practitioner. Dr. Foster has, therefore, apparently endeavored to gather the important points in such a way that they can be understood by the general practitioner.

It seems to us that this book will prove of interest to those who in turn are particularly interested in this important malady; that the general practitioner will still obtain most, if not all, of the information that he needs from recently prepared text-books; and that special students of this subject will probably desire to consult other books of larger size, although they may be glad to add the present volume to those which they have already collected on this important matter.

PROGRESSIVE MEDICINE. A Quarterly Digest of Advances, Discoveries, and Improvements in the Medical and Surgical Sciences. Edited by H. A. Hare, M.D., Assisted by L. F. Appleman, M.D. Volume 1, March, 1915.

The March issue of Progressive Medicine contains, as in previous years, an article dealing with Surgery of the Head and Neck, by Charles H. Frazier, M.D.; another upon Surgery of the Thorax, by George P. Müller, M.D.; a third upon Infectious Diseases, Including Acute Rheumatism, Croupous Pneumonia, and Influenza, by John Ruhräh, M.D.; a fourth upon Diseases of Children, by Floyd M. Crandall, M.D.; a fifth covers Rhinology and Laryngology, by George B. Wood, M.D.; the sixth, or last article in the series,

is contributed by Truman L. Saunders, M.D., a new collaborator in Progressive Medicine, who is Chief of Clinic in the Vanderbilt Clinic, and Instructor in Otology in the College of Physicians and Surgeons in New York. All of these collaborators are well-known men who have prepared their articles not only as the result of making themselves sufficiently familiar with the literature of the year, but also with the object of giving the reader their own personal opinions as to the advances which have been made, criticizing adversely or favorably the expressions of opinion made by other writers in their special fields.

LECTURES ON THE HEART. By Thomas Lewis, M.D., F.R.C.P. Paul B. Hoeber, New York, 1915. Price $2.00.

Many American medical men will recall the fact that during the autumn of 1914 Dr. Lewis visited the United States and delivered lectures upon the more recent investigations which have been made upon the physiology and pathology of the heart. Most of them were the so-called Herter or Harvey lectures. The one delivered at Montreal illustrates thoroughly the application of laboratory methods in the investigation of heart disease.

The lectures are divided into five chapters. The first deals with the Excitation Wave in the Heart. This is composed of the three Herter lectures delivered in the Johns Hopkins Hospital in October, 1914. Chapter II deals with the Methods of Using the Electro-cardiograph; Chapter III with the Relation of the Auricular Systole to Heart Sounds and Murmurs; Chapter IV, Observations upon Dyspnea, with Special Reference to Acidosis; and Chapter V, Observations upon Cardiac Syncope.

This little volume covers over one hundred pages, and is illustrated with a very considerable number of reproductions of tracings made by the electro-cardiograph. As a brief summarization of an important and comparatively novel subject, these lectures can be read with great profit by almost every medical man, even if he be actively engaged in the study of cardiac disease by the more modern methods.

INFECTION AND IMMUNITY. A Text-book of Immunology and Serology, for Students and Practitioners. By Charles E. Simon, B.A., M.D. Third Edition, Enlarged and Thoroughly Revised; 351 Pages, Illustrated. Lea & Febiger, Philadelphia, 1915. Price $3.25.

Unless we are mistaken Dr. Simon was the first physician in this country to prepare the text of a book dealing with these subjects, and the appearance of the third edition is evidence that the favorable impression which we received on the appearance of the first edition has been experienced by many of the medical profession.

In the few years that these subjects have been in existence the advances made along these lines have been most remarkable, and the author has not failed in the preparation of the third edition to keep it fully abreast of the times. Special attention is given to Abderhalden's protective ferments and the serum diagnosis of pregnancy, the so-called Schick reaction in relation to diphtheria, and also to the preparation of autogenous and other vaccines. One of the characteristics of this book has always been the fact that the author found it easy to discuss technical subjects in terms which were particularly easy for the general practitioner and student to understand, and this virtue is still maintained.

A MANUAL OF THE DISEASES OF INFANTS AND CHILDREN. By John Ruhräh, M.D. Fourth Edition, Thoroughly Revised. Illustrated. W B. Saunders Company, Philadelphia, 1915. Price $2.50.

Dr. Ruhräh is well known to many members of the medical profession as one who is able to express himself clearly when he puts pen to paper. Four editions of this excellent little book have appeared during the last ten years. In the present edition numerous minor changes and additions have been made and special attention has been paid to the use of the soy-bean in infant feeding, the differential diagnosis between drug eruptions and ordinary eruptive diseases, and the Binet-Simon test for the mentality of children. The book is not large and exhaustive, but rather a small handbook for ready reference on the part of the busy practitioner. It is well illustrated, although,

in a few instances, the cuts are crude to such a degree as to be almost useless, as for example page 164, showing the amœba coli. The pictures of patients suffering from various forms of disease are, however, excellent, as are also those showing most of the eruptions. In the reproduction of Koplik's spots, as indicative of measles, the colors have been so badly used that the colored print is quite far removed from the actual conditions as seen in clinical medicine. A large amount of very useful information is given in the last hundred pages of the book in connection with the prescribing of drugs for children, and illustrative prescriptions are given in large number.

THE PRACTICAL MEDICINE SERIES. Under the General Editorial Charge of Charles L. Mix, A.M., M.D., and Roger T. Vaughan, M.D. Volume 8, Series of 1914. The Year Book Publishers, Chicago, 1914.

Volume eight of the Practical Medicine Series has as its departments one on Materia Medica and Therapeutics, by George F. Butler; one upon Preventive Medicine, by Henry B. Favill, M.D.; and one upon Climatology, by Norman Bridge, M.D. The part devoted to Therapeutics covers 281 pages; that devoted to Preventive Medicine extends from page 281 to page 349; and that upon Climatology, from page 353 to page 365. Most of the article on Preventive Medicine is taken up with the question of infectious diseases, and a large part of that devoted to Therapeutics deals with Extracts of Animal Organs.

THE PRACTICAL MEDICINE SERIES. Under the General Editorial Charge of Charles L. Mix, A.M., M.D., and Roger T. Vaughan, M.D. Volume 10. Nervous and Mental Diseases, Edited by Hugh T. Patrick, M.D., and Peter Bassoe, M.D. Series of 1914. The Year Book Publishers, Chicago, 1914.

As we have said in noticing the appearance of this volume of the Practical Medicine Series in previous years, few can be found who could be more clever and efficient in abstracting from medical journals knowledge as to diseases of the nervous system than Dr. Patrick, whose intense interest in this department of medicine has been well recognized for many years. The present volume, like its predecessors, endeavors to give us a conception of what has been written concerning neurology during twelve months.

CLINICAL DIAGNOSIS. A Manual of Laboratory Methods. By James Paul Todd, M.D. Illustrated. Third Edition, Revised and Enlarged. W. B. Saunders Company, Philadelphia, 1914. Price $2.50.

We have noticed the appearance of the earlier editions of this comparatively small book upon Clinical Diagnosis and have always been able to say something pleasant concerning it. It is, as its name implies, a small laboratory manual not detailing physical signs, but describing the laboratory methods which are commonly resorted to where clinical medicine is practiced accurately. The various forms of apparatus are clearly described in text and in pictures, as are also the commonly used stains, the value of which is universally recognized. The book is typically one which might be purchased by the general physician who is building for himself a small laboratory in which to carry out more accurate investigations concerning his patients than would be possible with his older facilities.

A REFERENCE BOOK ON THE FEDERAL NARCOTIC LAW. For Physicians, Druggists, Dentists, and Veterinarians. By Arthur Dean Currier and Daniel R. Forbes.

As may be imagined, this so-called reference book is necessarily somewhat diminutive, covering only 45 pages. It is rather a pamphlet than a book. One of the authors, Mr. Currier, is a member of the Chicago Bar, and Mr. Forbes was at one time with the U. S. Board of Food and Drug Inspection. Their idea is to make clear technicalities of the law to those who are not well trained in the interpretation of statutes. The contents of the book consist, first, in a reprint of the law, then follow notes by the authors on the intent and spirit of the law, an analysis of the law, regulations with special reference as to registration, and finally, and perhaps most important, a synopsis of the rulings and questions relating to this law published by the Treasury Department for the information of internal revenue officers and others concerned. The price of

the pamphlet is 25 cents, and it may be obtained from the Secretary of the National Association of Retail Druggists, 122 South Michigan Avenue, Chicago.

THE PRINCIPLES OF HYGIENE. By D. H. Bergey, A.M., M.D. Illustrated. Fifth Edition, Thoroughly Revised. W. B. Saunders Company, Philadelphia, 1914.

In the fifth edition of Dr. Bergey's book on Hygiene he has embraced the opportunity of bringing the text of the fourth edition up to date. We do not see that any particularly noteworthy additions have been made to the present edition. The book, as those who possess the early editions know, deals with the ordinary theme of hygiene as it is taught to medical students and as it is practiced by physicians and health officers. It does not profess to be an exhaustive treatise, but rather one which can be readily studied and wholly assimilated by the novice in this line of work.

A NURSING MANUAL FOR NURSES AND NURSING ORDERLIES. By Duncan C. L. Fitzwilliams, M.D., F.R.C.S. Oxford University Press, London, 1914. Price $2.00.

The author points out in his preface that no excuse is needed for the issuing of a book which it is hoped will increase knowledge among nurses, nursing orderlies, and Red Cross workers in such a way as to promote the efficiency of their nursing and thereby help to relieve suffering. This manual is based upon the instructions the author has endeavored to impart at St. Mary's Hospital, London, and at Paddington Green Children's Hospital, as well as to non-commissioned officers and men of the First City of London Field Ambulance. The book is primarily intended for the use of nurses, and the author has endeavored to include all the essentials which a nurse, nursing orderly, or Red Cross worker should know. A great deal of first-aid in Red Cross work now falls to the hands of the male nurse and orderly, and for that reason a chapter dealing with First Aid in the Field has been carefully prepared.

INTERNATIONAL CLINICS. A Quarterly of Illustrated Clinical Lectures and Original Articles. Edited by Henry W. Cattell, A.M., M.D. J. B. Lippincott Company, Philadelphia, 1915. Volume 1. Price $2.00.

We have so often called the attention of our readers to this Quarterly, made up chiefly of clinical lectures by well-known medical men, that they must be familiar at least with its intent. The present volume contains an opening article by Sir William Osler, and concludes with a summarization of the progress of medicine during the year 1915 by Henry W. Cattell, E. W. Watson, and Samuel W. Wilson.

CORRESPONDENCE.

LONDON LETTER.

BY J. CHARLTON BRISCOE, M.D.

In this month of March we have had the usual variation in the weather from warm sunshine to sleet and snow, but with much less wind than usual. Looking on the past winter we have escaped any severe fogs. There was only one troublesome fall of snow, which was rendered more inconvenient owing to the fact that men were not available to clear the pavements and remove the snow from the streets. This shows a great difference from the usual, for on the morning following a fall of snow in London there seems to be quite an army of men, who are otherwise unemployed, at work removing the snow and thereby rendering the footpaths clear for pedestrians. It is one effect of the war that unemployment is reduced to a minimum with regard to able-bodied men.

I referred in a previous article to the number of deaths reported of elderly people. This still continues, and during the past month the number of deaths among the aged has been very considerable and far in excess of the number which usually occur. Owing to the large number of those

of military age who have joined the army it is now quite noticeable in the streets that the majority of men are obviously over the age of forty-five years, or if younger exhibit some defect, such as the wearing of glasses, which renders them unfit for service. I think this change from the usual has only attracted attention during the past month or six weeks, and in contrast there appear to be a much larger number of women than formerly.

We are still suffering from lack of light in the evenings; indeed, recently, the diminution of street light has been more marked than formerly. The lamps are shaded so that the rays of light cannot be seen from above. The upper parts of the sides of the lamps have recently been darkened by the application of some form of yellow material, either paint or paper, the lower part of the side light being left untouched. The result of this is that underneath the lamps there is full light, whereas at ten or fifteen yards away a shadow begins to fall, and at a further distance the darkness is very considerable. In spite of this fact the number of street accidents does not seem to have increased. There is still a diminution in the number of motor busses, and recently they have apparently been taken for various lines of service. It is also quite noticeable that the drivers both of the busses and taxicabs are to be included with those who have passed the prime of life. There also appears to be a marked diminution of the general traffic, lorries, carts, etc., and even the ubiquitous bicycle does not intrude on one's notice as formerly.

Apropos of recent strikes which have occurred in various industrial centers, but which are now apparently settled and under control, there can be no question at all that the wages ought to be increased in view of the fact that the price of living has actually gone up at least twenty to twenty-five per cent. This was brought home to me very forcibly last week when I had to investigate the accounts of a students' hostel. The increase in price was distributed practically over every article of consumption, but it is not only food for which more has to be paid. The price of gas has risen in different areas by fourpence to eightpence per thousand cubic feet, and there is some reason to anticipate that even such businesses as laundries will be making additions to their prices during the coming months. It is therefore obvious that it is not only the working man who will have to pay more, but that every class will find an increase of their expenses to some extent. This will undoubtedly hit the man with the fixed income, such as the clerk, who very often lives very close to the line, as well as the mechanic.

More efforts are being made, not only in London but throughout the country, to place a larger number of beds at the disposal of the War Office. With this object a certain number of schools are being taken over, and I understand that several asylums are being offered and their inmates removed to various similar institutions in other parts of the country; also some of the infirmaries are being utilized in this way. Quite a number of private houses have been given over and are being used both as hospitals and convalescent homes. The new King George's Hospital, which is to occupy the buildings put up for H. M. Stationary Department, is admirably situated to receive soldiers, being in the vicinity of Waterloo Station. The building covers one and a half acres and will contain five floors, which can be utilized for the wards. The kitchens are going to be at the top of the building, and the ground floor is to be given up to administrative offices, recreation rooms, dispensaries, and laboratories. The building has been greatly altered owing to the new sanitary equipment which has to be introduced. The building is fitted out with lifts which are large enough to take stretchers. The great feature of the hospital, however, will be its flat roof, covering, as we have already said, about one and a half acres, and offering ample room for the convalescents to air themselves upon. The hospital is estimated to hold over sixteen hundred patients, and the honorary medical staff is already provided. This was

one of the buildings the construction of which was impeded very largely by the builders' strike last year. Time has, however, been made up, and it is anticipated that everything will be ready very shortly. The equipment of the building is in the hands of the St. John's Ambulance Association and the Red Cross Society, who are also providing the nursing staff.

There appears to be a certain shortage in the supply of nurses at the present time, in spite of the fact that a considerable number have come from Australia, New Zealand, Africa, Canada, and also from the States. A number of these nurses had originally gone out from this country, but on the other hand I have passed quite a number who were natives of Australia and New Zealand. In order to overcome this deficiency postgraduate classes in nursing have been instituted for those who have been trained as nurses but have not been following this vocation in recent years, and no doubt they will soon be available for service. A much larger number of orderlies are now enrolled in the Royal Army Medical Corps than formerly. A number of men in London have offered themselves in the capacity of stretcher bearers to transport stretcher cases from the ambulance wagons to their beds in the hospital. Thus when the wounded are brought into voluntary hospitals it is only necessary to ring up certain of the large shops, and squads are sent on to the hospital to unload the wagons and get the cases into their beds. This is of great assistance and avoids the delay which would necessarily occur if the hospital staff were called upon to perform these duties. Probably a number of these men as well as men from the railway organizations could serve should a shortage of orderlies be felt in the future. The interest in the wounded does not flag at all in spite of the duration of the war, and some of them complain that too many visitors are allowed to come and see them. It is also of special notice that the number of motor cars for taking the convalescents for drives has not in the least fallen off, and such supply is quite ample for the purpose.

Considerable alarm has been felt throughout the country owing to the presence of cerebrospinal meningitis in epidemic form. This has apparently been disseminated over most parts of the country, and the type of case has been rather severe, a number of deaths having occurred. It is of course recognized that this epidemic was likely to occur where troops were congregated in large numbers. However, a certain number of cases have occurred in areas which were not immediately occupied by the military and have affected the civil population. It had been remarked by the medical officers looking after these cases that the advent of sunshine immediately stops the spread of the disease, and it is to be anticipated that in the ensuing month, when sunshine will be likely to predominate, that the epidemic will entirely die out and the disease will resume a sporadic nature. We have also had "an epidemic of influenza" which was characterized by rather different symptoms from the usual. After about a week of cold in the head an acute exacerbation takes place, and when this is passing off severe laryngitis sets in. This has been quite a common occurrence during the past three or four weeks, but has again now diminished. Typhoid has not occurred to any extent, and I have not heard of any cases of typhus. This disease appears, however, to be raging in Serbia and to have attacked a large percentage of the population.